



U. S. /CANADA COOPERATIVE PINK AND SOCKEYE SALMON TAGGING,
INTERCEPTION RATES, MIGRATION PATTERNS, RUN TIMING, AND
STOCK INTERMINGLING IN SOUTHERN SOUTHEASTERN ALASKA
AND NORTHERN BRITISH COLUMBIA, 1982

By:

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ADF&G TECHNICAL DATA REPORTS

This series of reports is designed to facilitate prompt reporting of data from studies conducted by the Alaska Department of Fish and Game, especially studies which may be of direct and immediate interest to scientists of other agencies.

The primary purpose of these reports is presentation of data. Description of programs and data collection methods is included only to the extent required for interpretation of the data. Analysis is generally limited to that necessary for clarification of data collection methods and interpretation of the basic data. No attempt is made in these reports to present analysis of the data relative to its ultimate or intended use.

Data presented in these reports is intended to be final, however, some revisions may occasionally be necessary. Minor revision will be made via errata sheets. Major revisions will be made in the form of revised reports.

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ABSTRACT

A major pink (*Oncorhynchus gorbuscha*) and sockeye (*O. nerka*) salmon tagging project was conducted during 1982 in southern Southeastern Alaska and northern British Columbia. The objectives were to investigate the interception rates, migration patterns, run timing, and degree of stock intermingling of pink and sockeye salmon returning to these areas. Previous pink and sockeye salmon tagging investigations had illustrated the extremely mixed nature of southern Southeastern Alaska and northern British Columbia pink and sockeye salmon fisheries, defined major stock groups, and identified major migration routes. However, more up-to-date and precise information on interception rates in boundary area fisheries, migration patterns, run timing, and stock intermingling is required for effective salmon management by both countries' fisheries management agencies.

A total of 81,838 pink and 8,720 sockeye salmon were tagged and released between 1 June and 30 August in southern Southeastern Alaska. In addition, 73,867 pink salmon and 36,875 sockeye salmon were tagged and released between 1 June and 15 September in northern British Columbia. Chartered seine and troll vessels (Canadian side only) were employed to capture fish in eight general release areas in southern Southeastern Alaska and twelve areas in northern British Columbia. Highly visible, sequentially numbered, and uniformly labeled red Peterson disk tags were used to facilitate maximum commercial and spawning ground recoveries. Approximately 18.0% of the pink salmon released (12.8% in Alaska, 5.2% in Canada) and 35.6% of the sockeye salmon released (4.9% in Alaska, 30.7% in Canada) were recovered in spawning streams, and commercial and sport fisheries in southern Southeastern Alaska and northern British Columbia. The distribution and recovered pink salmon tags in southern Southeastern Alaska illustrated that the majority of the District 101 and 102 stocks returned through Dixon Entrance and lower Clarence Strait. Pink salmon destined for Districts 103 and 104 moved inshore via Dixon Entrance and numerous passages leading inshore to the west coast island systems located in southern Southeastern Alaska. Districts 105, 106, 107, and 108 pink salmon stocks predominately moved inshore through lower Sumner Strait as did portions of lower District 109 and 110 pink salmon stocks. On the other hand, pink salmon destined for upper Hecate Strait and Portland Inlet systems (Nass River, Skeena River, etc.) in northern British Columbia returned via two migratory routes. Pink salmon destined for these areas returned via lower Hecate Strait or upper Hecate Strait from Dixon Entrance or from Sumner/Clarence Strait.

The distribution of recovered sockeye salmon tags in southern Southeastern Alaska illustrated that District 101 and 102 sockeye returned via Dixon Entrance and Sumner/Clarence Strait, while District 103 and 104 sockeye salmon moved directly inshore via numerous west coast island passages and Cordova Bay. The majority of District 106, 107, and 108 sockeye salmon stocks moved inshore to their natal streams via lower Sumner Strait while a small percentage returned via Dixon Entrance and lower Clarence Strait. Due to the limited number of recoveries, very little can be stated concerning the migratory patterns of sockeye salmon from Districts 105, lower 109, and lower 110. On the other hand, sockeye salmon destined for Hecate Strait and Portland Inlet systems (Nass River, Skeena River, etc.) in northern British Columbia returned via several different routes, Skeena River sockeye returned via Dixon Entrance, Sumner/Clarence Strait, and lower Hecate Strait. Sockeye salmon returning to the Nass River returned via Dixon Entrance and Sumner/Clarence Strait only.

Pink and sockeye salmon migrations occurred in a fairly orderly manner throughout the study areas. Peak migration periods were evident for some individual stocks and larger units, suggesting that effective management strategies based on run timing may be devised by adjusting fishing periods to, or around, migration periods and/or homogenous areas of concentration to protect or direct harvest to selected stocks. However, this approach may be limited by the degree of stock intermingling in most areas of southern Southeastern Alaska and northern British Columbia, especially during July and August.

Estimates of national contribution rates in the primary tag release areas were derived from the 1982 adult salmon tagging study. These estimates reflect national stock proportions in the study areas during the tag release periods for the combination of relative stock sizes and migration patterns which occurred in 1982. In the range of estimates considered most likely, estimates of Canadian contribution rates in eight southern Southeastern Alaska study areas ranged from 0% to 18% for pinks and 8% to 74% for sockeye. In seven northern British Columbia study areas, estimated Alaska contribution rates ranged from 6% to 71% for pinks and 0% to 18% for sockeye. Comparing national contribution rate estimates from the 1982 study and previous U.S./Canada Technical Interception Reports, estimates from the two sources were generally similar for southern Southeastern Alaska pink salmon fisheries and northern British Columbia sockeye salmon fisheries, but substantially different for northern British Columbia pink salmon fisheries and southern Southeastern Alaska sockeye salmon fisheries. Possible causes of these differences are discussed.

KEY WORDS: salmon tagging, migration patterns, interception rates, run timing, stock intermingling, *Oncorhynchus gorbuscha*, *O. nerka*.

INTRODUCTION

The identification of pink (*Oncorhynchus gorbuscha*) and sockeye (*O. nerka*) salmon interception rates, migration routes, run timing, and degree of stock intermingling is information vital to sound stock concept management. Much of this information, however, is not available for major southern Southeastern Alaska and northern British Columbia pink and sockeye salmon fisheries. The purpose of this report is to present the results of a major adult pink and sockeye salmon tagging investigation conducted by the National Marine Fisheries Service, the Alaska Department of Fish and Game, and the Canada Department of Fisheries and Oceans during 1982 in the coastal waters of southern Southeastern Alaska and northern British Columbia (Figure 1).

Southeastern Alaska and British Columbia pink and sockeye salmon resources are composed of a heterogeneous group of stocks. Several thousand spawning streams of varying size, productivity, and run timing are situated on the many islands and the mainland within both countries' territory. The waterways through which adult fish migrate and are harvested are composed of a complex system of straits, inlets, and bays. When combined with the heterogeneous nature of the returns, considerable intermingling of both pink and sockeye stocks occurs in many major fishing areas.

This study was prompted by the realization that a serious lack of information was hampering effective management of southern Southeastern Alaska and northern British Columbia mixed stock pink and sockeye salmon fisheries. More precise information derived from a joint research project concerning interception rates, migration routes, run timing, and stock intermingling is needed to improve the management capabilities of each countries' fishery agencies.

OBJECTIVES

The major goal of the joint U.S./Canada salmon interception research project is to define stock separation techniques to improve the management of southern Southeastern Alaska and British Columbia salmon resources. As an initial endeavor, a major pink and sockeye salmon tagging study was accomplished in southern Southeastern Alaska by the Alaska Department of Fish and Game, and in northern British Columbia by the Canada Department of Fisheries and Oceans.

The objectives of this study were to:

1. Estimate interception levels of Alaskan and Canadian pink and sockeye salmon in major fisheries of both countries in 1982.
2. Describe migration routes, run timing, and degree of stock intermingling of pink and sockeye salmon passing through Southeastern Alaska and British Columbia waters in 1982.

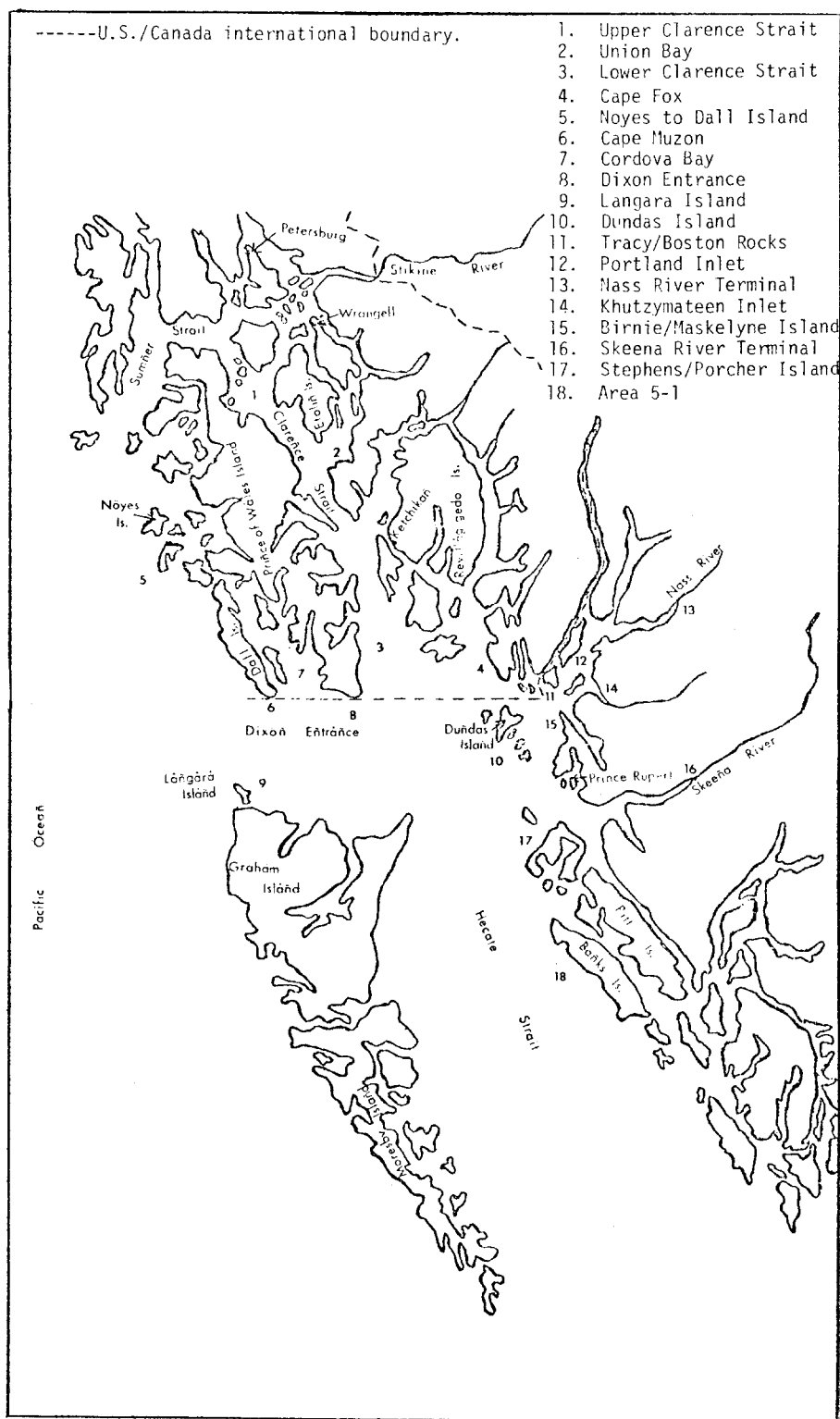


Figure 1. U.S./Canada salmon interception research tag release sites in 1982.

PREVIOUS TAGGING STUDIES

Historically, considerable pink and sockeye salmon tagging has been accomplished in southern Southeastern Alaska and northern British Columbia (Tables 1 and 2). From the earliest investigations in the 1920s in both countries to the most recent experiments in 1981 on pink salmon in Alaska and in 1968 on sockeye salmon in British Columbia, approximately 153,000 tagged pink salmon and 25,400 tagged sockeye salmon have been released in the coastal waters adjacent to these two countries. A total of 45,900 tagged pink salmon (30%) and 10,156 tagged sockeye salmon (40%) were recovered. The majority of the recoveries came from the commercial fisheries in each country. This information has been valuable in defining major entryways and general migration patterns. A general review of the results from these studies was undertaken by combining the release and recovery information into major geographical areas (Appendix Tables 1-4). In this analysis, the following observations were of major importance.

1. The lack of a significant number of recoveries from the outside coast of southern Southeastern Alaska, except for releases on the southwestern coast of Prince of Wales Island, illustrated the general integrity of the area's local pink salmon stocks.
2. Only a few pink salmon released in Sumner Strait were recovered on the outside coast of Prince of Wales Island. Additionally, only a minor movement by Clarence Strait releases to the outside coast of Prince of Wales Island was noted.
3. There were major movements of pink salmon from lower Sumner Strait into upper Sumner and Clarence Strait.
4. A distinct movement of pink salmon from lower Clarence Strait into middle and upper Clarence Strait was noted.
5. A significant number of the pink salmon releases along the southwest coast of Prince of Wales Island were recovered in Canadian waters.
6. Only a few of the tagged pink salmon released along the outside coast of Prince of Wales Island were recovered in Sumner and Clarence Straits.
7. A significant number of the pink salmon released in Dixon Entrance and upper Hecate Strait were recovered in Southeastern Alaska Districts 101 and 102.
8. A significant number of sockeye salmon released in Sumner Strait were destined for Canadian waters.
9. A significant number of sockeye salmon released at Cape Fox were destined for Canadian waters.
10. A significant number of sockeye salmon released off the western coast of Prince of Wales Island were destined for Canadian waters.

Table 1. Pink and sockeye salmon tagging in southern Southeastern Alaska, 1924-1981.

Year	Location	Inclusive Dates	Number of Releases	Source
1924	Sumner Strait Ruins Point	July 12 - Aug. 10	250 Pinks 250 Sockeye	Rich, 1926
1924	S. Portland Canal Kanagunut Point	August 7	22 Pinks	Rich, 1926
1924	S. Clarence Strait Tree Point	August 8	203 Pinks	Rich, 1926
1924	S.E. Clarence St. Duke Point Point White	August 8 - 9	482 Pinks	Rich, 1926
1925	Sumner Strait Ruins Point	July 17 - 25	1,217 Pinks 363 Sockeye	Rich, 1926
1925	S.W. Clarence St. Stone Rock Bay Cape Chacon	August 8 - 13	2,341 Pinks 121 Sockeye	Rich, 1926
1925	West Coast Prince of Wales Island Cape Muzon Kaigani Point	August 15 - 22	3,049 Pinks	Rich, 1926
1925	S. Clarence St. Foggy Point	July 30 - 31	1,043 Pinks	Rich, 1926
1926	S. Clarence St. Cape Fox	June 24 - July 1	137 Pinks 761 Sockeye	Rich and Suomela, 1927
1926	S.E. Clarence St. Nelson Cove	July 6 - 7	288 Pinks 68 Sockeye	Rich and Suomela, 1927
1926	S.W. Clarence St. Stone Rock Bay	August 9	4 Sockeye	Rich and Suomela, 1927
1926	West Coast Prince of Wales Island Cordova Bay Long Island	August 10	1,479 Pinks 55 Sockeye	Rich and Suomela, 1927

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Table 1. Pink and sockeye salmon tagging in southern Southeastern Alaska, 1924-1981 (continued).

Year	Location	Inclusive Dates	Number of Releases	Source
1926	Sumner Strait Point Colpoys	July 10	259 Pinks 705 Sockeye	Rich and Suomela, 1927
1927	Sumner Strait Point Colpoys	July 26 - 30	577 Pinks 383 Sockeye	Rich and Morton, 1929
	Cape Decision	July 30	164 Pinks 29 Sockeye	Rich and Morton, 1929
1927	S.E. Clarence St. Dall Head Nelson Cove	August 5 August 6 August 5 - 6	86 Pinks 240 Pinks 11 Sockeye	Rich and Morton, 1929
1930	S. Clarence St. Portland Canal Sitklan Island Kanagunut Island	July 13 - Aug. 8 July 13 - Aug. 8	626 Pinks 628 Pinks	Rich, 1932 Rich, 1932
1930	S. Clarence St. Cape Fox Sitklan Island Kanagunut Island	July 26 - Aug. 7 July 3 - Aug. 8	489 Pinks 109 Sockeye	Rich, 1932 Rich, 1932
1930	S.W. Clarence St. South Entrance Kasaan Bay	July 29 - Aug. 14	281 Pinks	Rich, 1932
1930	North Entrance Kasaan Bay	August 3 - 14	327 Pinks	Rich, 1932
	Kasaan Bay to Windfall Harbor	July 29 - Aug. 14	61 Sockeye	Rich, 1932
1930	Clarence St. Central Near Windfall Harbor	August 3	87 Pinks	Rich, 1932
1930	North Entrance Windfall Harbor	August 3	200 Pinks	Rich, 1932
1930	South Entrance Windfall Harbor	August 14	234 Pinks	Rich, 1932

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Table 1. Pink and sockeye salmon tagging in southern Southeastern Alaska, 1924-1981 (continued).

Year	Location	Inclusive Dates	Number of Releases		Source
1932	S.E. Clarence St. Duke Point	August 5	467	Pinks	Davidson and Christey, 1937
1935	S.W. Clarence St. McLean Point	July 22 - Aug. 17	1,857	Pinks	Davidson and Christey, 1937
1935	Sumner Strait Point Colpoys	August 13	386	Pinks	Davidson and Christey, 1937
1936	S.W. Clarence St. McLean Point	July 18 - Aug. 15	2,441	Pinks	Davidson and Christey, 1937
1936	Sumner Strait Point Colpoys	July 16	498	Pinks	Davidson and Christey, 1937
1947	S. Clarence St. Cape Fox	July 20 - Sept. 2	1,544	Pinks	Verhoeven, 1952
	Breakwater North	July 20 - Sept. 2	1,341	Pinks	Verhoeven, 1952
	State Island	July 21 - Sept. 3	2,402	Pinks	Verhoeven, 1952
	Ham Island	July 26 - 31	231	Pinks	Verhoeven, 1952
	Cove Island	July 31 - Aug. 21	835	Pinks	Verhoeven, 1952
	Lucky Cove	July 31 - Sept. 3	804	Pinks	Verhoeven, 1952
	Thorne Arm	Aug. 6 - Sept. 3	912	Pinks	Verhoeven, 1952
	Kah Shakes	Aug. 8 - 19	514	Pinks	Verhoeven, 1952
	Point Sykes	Aug. 17 - Sept. 3	446	Pinks	Verhoeven, 1952
	Shoalwater Pass	Aug. 13	88	Pinks	Verhoeven, 1952
	Short Point	Aug. 19	13	Pinks	Verhoeven, 1952
1947	S.E. Clarence St. Davison Point	July 23 - Aug. 24	1,206	Pinks	Verhoeven, 1952
	Percy Island	July 29 - Sept. 1	1,831	Pinks	Verhoeven, 1952
	Dall Head	July 29 - Sept. 7	1,384	Pinks	Verhoeven, 1952
	Gravina Island	July 30 - Aug. 31	1,326	Pinks	Verhoeven, 1952
	Cedar Point	Aug. 1 - Sept. 1	845	Pinks	Verhoeven, 1952
	Duke Point	Aug. 3 - Aug. 20	265	Pinks	Verhoeven, 1952
	Nichols Passage	Aug. 14 - 22	200	Pinks	Verhoeven, 1952
	Blank Point	Aug. 14 - Sept. 1	963	Pinks	Verhoeven, 1952

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Table 1. Pink and sockeye salmon tagging in southern Southeastern Alaska, 1924-1981 (continued).

Year	Location	Inclusive Dates	Number of Releases.		Source
1947	S.W. Clarence St.				
	Kendrick Bay	Aug. 2 - 30	728	Pinks	Verhoeven, 1952
	McLean Point	Aug. 2 - 30	744	Pinks	Verhoeven, 1952
	Bean Island	Aug. 10 - 23	423	Pinks	Verhoeven, 1952
	Point Nunez	Aug. 16	101	Pinks	Verhoeven, 1952
	Landslide	Sept. 6	292	Pinks	Verhoeven, 1952
	Hidden Bay	Sept. 7	333	Pinks	Verhoeven, 1952
1947	Clarence Strait				
	N. Behm Canal				
	Escape Point	Aug. 17 - 31	701	Pinks	Verhoeven, 1952
	Indian Point	Aug. 27	392	Pinks	Verhoeven, 1952
	Bell Island	Aug. 5	203	Pinks	Verhoeven, 1952
1947	Clarence Strait				
	Central, S.W. and Southeast		367	Sockeye	Verhoeven, 1952
1947	Black Island	Aug. 12	148	Pinks	Verhoeven, 1952
	Point Lees	Aug. 13	117	Pinks	Verhoeven, 1952
1951	Sumner Strait				
	Pont Amelius	Aug. 5 - 29	13,149	Pinks	Elling and Macy, 1951
	Point Baker	Aug. 5 - 26	3,027	Pinks	
1957	S.W. Prince of Wales Island				Noerenberg and Tyler, 1971
	Cape Addington	July 16 - Aug. 25	7,519	Pinks	Noerenberg and Tyler, 1971
	Cape Ulitka	July 27 - Aug. 14	3,959	Pinks	Noerenberg and Tyler, 1971
1957	S.W. Prince of Wales Island				Noerenberg and Tyler, 1971
	Cape Addington	July 25 - Aug. 11	500	Sockeye	Noerenberg and Tyler, 1971
	Cape Ulitka	August 1	1	Sockeye	Noerenberg and Tyler, 1971
1957	N.W. Prince of Wales Island				Noerenberg and Tyler, 1971
	Point Desconocida	Aug. 24 - Sept. 2	3,158	Pinks	Noerenberg and Tyler, 1971

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Table 1. Pink and sockeye salmon tagging in southern Southeastern Alaska, 1924-1981 (continued).

Year	Location	Inclusive Dates	Number of Releases		Source
1957	Prince of Wales Island				Noerenberg and Tyler, 1971 Noerenberg and Tyler, 1971
	Ruth Bay	Aug. 17 - 18	1,099	Pinks	
	McLead Bay	Aug. 17 - 18	800	Pinks	
1958	S.W. Prince of Wales Island				Noerenberg and Tyler, 1971 Noerenberg and Tyler, 1971 Noerenberg and Tyler, 1971 Noerenberg and Tyler, 1971 Noerenberg and Tyler, 1971
	Cape Adoington	July 9 - Aug. 24	2,930	Pinks	
			1,119	Sockeye	
	Cape Ulitka	July 25 - Aug. 24	1,735	Pinks	
			2,895	Sockeye	
	Granite Point	July 19 - Aug. 1	200	Pinks	
1958			77	Sockeye	Noerenberg and Tyler, 1971 Noerenberg and Tyler, 1971 Noerenberg and Tyler, 1971 Noerenberg and Tyler, 1971
	Roller Bay	July 24	60	Pinks	
			19	Sockeye	
	Tranquel Point	July 28 - Aug. 14	1,111	Pinks	
1958	N.W. Prince of Wales Island				Noerenberg and Tyler, 1971 Noerenberg and Tyler, 1971
	Point Desconocida	July 26 - Aug. 25	2,474	Pinks	
			5,945	Sockeye	
1958	Tranquel Point	July 28	42	Sockeye	Noerenberg and Tyler, 1971
1958	Prince of Wales Island				Noerenberg and Tyler, 1971
	Cordova Bay	July 31 - Aug. 21	300	Pinks	
	McLeod Bay	July 31	91	Sockeye	
1981	Tolstoi Point	July 10 - 29	2,278	Pinks	Hoffman, 1982
	Myers Chuck	July 10 - 28	4,668	Pinks	Hoffman, 1982
	Union Bay	July 1 - 15	355	Pinks	Hoffman, 1982
	Steamer Point	July 3 - Aug. 5	2,584	Pinks	Hoffman, 1982
	Point Baker	July 8 - 17	14	Pinks	Hoffman, 1982
	Shipley Bay	July 7 - 21			
		Aug. 8 - 13	670	Pinks	Hoffman, 1982
	Port Beauclerc	July 7 - 21			
		Aug. 8 - 13	675	Pinks	Hoffman, 1982

Table 2. Pink and sockeye salmon tagging in British Columbia waters, 1929-1968.

<u>Year</u>	<u>Location</u>	<u>Inclusive Dates</u>	<u>Number of Releases</u>	<u>Source</u>
1929	Johnstone Strait Broughton Strait	July - September	468 Pinks	Pritchard
1929	Sooke Fish Traps	August - September	185 Pinks	
1925	Haystack Island	August 3 - 21	659 Sockeye	Williamson
1944	Areas 3, 4, and 5	June - July 21	1373 Sockeye	Unknown
1945	Areas 3, 4, and 5	June 2 - July 30	1594 Pinks 2806 Sockeye	Unknown
1946	Areas 3, 4, and 5	June 12 - July 28	290 Pinks 2418 Sockeye	Unknown
1947	Areas 3, 4, and 5	June 12 - July 27	619 Pinks 2746 Sockeye	Unknown
1948	Areas 3 and 4	June 10 - July 18	144 Pinks 2462 Sockeye	Unknown
1956	Areas 3, 4, 5 and Southern Southeast Alaska	June 15 - August 30	1254 Pinks 128 Sockeye	Unknown
1957	Areas 3, 4, and 5	June 5 - August 22	6914 Pinks 1534 Sockeye	Unknown
1958	Areas 3, 4, and 5	July 12 - August 12	6628 Pinks 761 Sockeye	Unknown
1966	Dixon Entrance (Area 1)	June 30 - August 30	9795 Pinks 738 Sockeye	Pella
1966	Dundas Island (Area 3)	June 30 - August 30	2363 Pinks 1499 Sockeye	Pella
1966	Browning Entrance (Porcher Island)	June 30 - August 30	1883 Pinks 130 Sockeye	Pella
1966	Hecate Strait (Areas 2,4,5, and 6)	June 30 - August 30	77 Pinks 2 Sockeye	Pella
1967	Dixon Entrance (Area 1)	June 30 - August 30	4361 Pinks 1029 Sockeye	Pella
1967	Dundas Island (Area 3)	June 30 - August 30	400 Pinks 322 Sockeye	Pella
1967	Browning Entrance (Porcher Island)	June 30 - August 30	20 Pinks 0 Sockeye	Pella
1967	Hecate Strait (Areas 2,4,5, and 6)	June 30 - August 30	27 Pinks 0	Pella
1968	Dixon Entrance (Area 1)	June 15 - August 21	3738 Pinks 1 Sockeye	Pella
1968	Dundas Island (Area 3)	June 15 - August 21	9331 Pinks 1027 Sockeye	Pella
1968	Browning Entrance (Porcher Island)	June 15 - August 21	3498 Pinks 4 Sockeye	Pella
1968	Hecate Strait (Area 2,4,5, and 6)	June 15 - August 21	5674 Pinks 8 Sockeye	Pella

11. A small portion of the sockeye salmon tagged and released in Dixon Entrance were recovered in Southeastern Alaska Districts 101 and 102.
12. Most sockeye salmon tagged and released in Dixon Entrance and upper Hecate Strait were recovered in Canadian waters.

In summary, a considerable amount of pink and sockeye salmon tagging has been accomplished over the past 60 years. These investigations have demonstrated the complex nature of pink and sockeye salmon movements, defined major entryways, and identified important migration pathways. However, more precise information on interception rates, migration routes, and run timing in and through major fishing areas in southern Southeastern Alaska and northern British Columbia will be required for effective salmon management in both countries' coastal waters.

METHODS

Chartered purse seine and troll fishing vessels were employed to capture adult pink and sockeye salmon. A total of five seine vessels were chartered in Alaskan waters by the Alaska Department of Fish and Game, while nine seine vessels and five troll vessels were chartered by the Canadian Department of Fisheries and Oceans to capture adult salmon in northern British Columbia coastal waters.

Pink and sockeye salmon were tagged and released at a variety of locations within the Clarence Strait, Tree Point, Cordova Bay, Noyes Island, Dixon Entrance, Hecate Strait, and Portland Inlet areas from early June through late August in Alaskan waters, and early June through early September in Canadian waters (Figure 1).

Tagging was conducted in intervals of one to fourteen days, depending upon the availability of fishing vessels, commercial fishery openings, weather conditions, and vessel breakdowns. Generally, concentrations of pink salmon were low in all areas at the beginning of the season, but increased dramatically to their highest numbers in August. On the other hand, sockeye salmon concentrations were highest from mid-June through late July followed by a marked decrease in August (Appendix Table 5).

Tags Employed

Highly visible, uniformly labeled, numerically sequenced red Peterson disk tags were employed to facilitate maximum recovery. Each tag consisted of two red plastic tags, a 1/4 inch clear plastic baffle, and a three-inch soft nickel plated steel needle. All tags used for primary tagging were 7/8 inch in diameter with one disk from each tag set numbered and labeled with the Canada Department of Fisheries and Oceans address in Vancouver, British Columbia, and the Alaska Department of Fish and Game address in Ketchikan, Alaska. Both agencies used this uniformly labeled tag for primary tagging to prevent fishermen from detecting which country released the tag, thus eliminating the bias which had been noted in previous tagging operations.

Tagging Operations

Standard power block purse seining methods were used in Alaskan waters and standard drum seining methods were used in Canadian waters to capture fish. However, at the termination of each set, instead of hoisting the bag end of the seine aboard, a holding pen of appropriate size was formed by using the seine skiff to support the webbing out from the boat. Individual fish could then be removed with a dip net, identified, tagged, and released.

Portable tagging equipment was employed, consisting of tagging boxes, stands, dip-nets, and tags arranged in numerical order. The tagging boxes were constructed of wood with the top side open to permit a soft piece of canvas material to be suspended, forming a "V" shaped enclosure, into which fish could be placed. The numbered disks were arranged in numerical order and pinned to styrofoam reels on Alaskan vessels, or styrofoam sheets on Canadian vessels. The reel consisted of a six-inch diameter styrofoam roll, 12 inches long, that was placed on a wooden dowel which, when mounted on the tagging table, would rotate allowing dispensing of tags in numerical order. The styrofoam sheets used on the Canadian vessels were 2' x 2' x 3" in size, onto which tags were pinned in numerical order and placed near the tagging table for easy access.

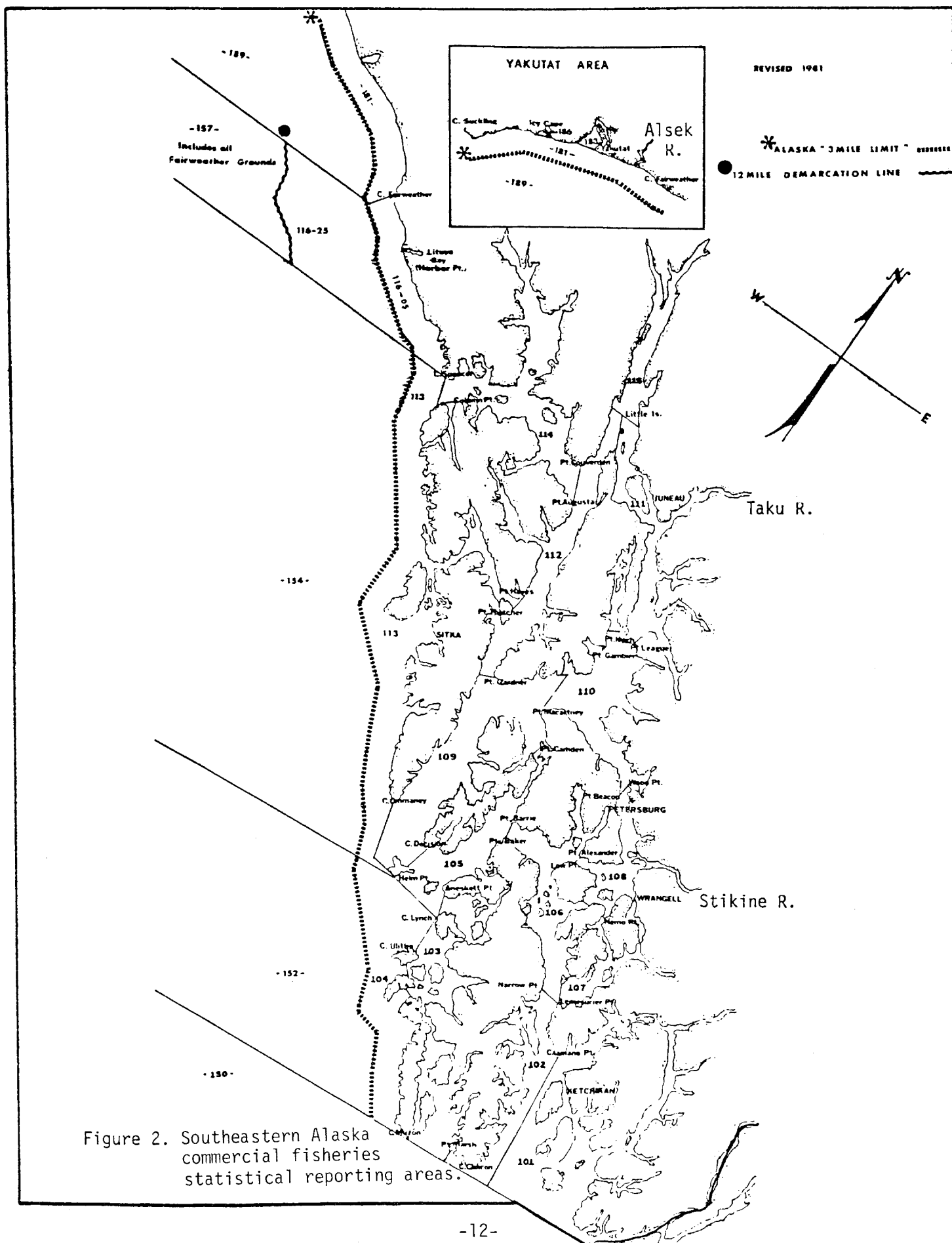
The fish were dipped individually from the seine, identified, and placed on the tagging table. One member of the tagging team held the fish while the other completed the tagging. Using long nosed pliers, the three-inch pin with numbered disk and baffle attached was forced through the fish under the dorsal fin. An unnumbered disk was next placed on the opposite side and the pin was trimmed so that approximately 3/4 of an inch remained. The portion of the pin extending beyond the disk was then twisted to form a single knot. This completed the tagging operation and the fish was released. Generally, two tagging teams were used and, after some experience was obtained, about 300 fish could be tagged per hour.

Tag Recovery Procedures

Tag recovery efforts were directed toward the spawning grounds, commercial, sport, and subsistence fisheries. A lottery with prizes totaling \$2500 was held twice during the season to encourage voluntary tag returns. In addition, considerable effort was placed on commercial catch sampling in all major fisheries and a news release was provided to the local news media informing the public of the tag releases and describing what to do with the recovered tags.

The recovery of tagged fish from the spawning grounds was given the most emphasis. Approximately 375 important pink and sockeye salmon spawning streams were selected in Alaska and 16 in Canada as primary recovery areas. The selection process was based on spawning capabilities, suitability for recovery, and geographical distribution.

Within Alaska, only those streams with an average historical pink salmon peak-count escapement (1961-1981) of over 4,000 in Districts 101-104, and over 1,000 in District 105-108 (Figure 2) were included in the selection process. Some streams were not considered suitable for tag recovery due to large size, excessive depth, or turbidity. In general, almost every major salmon spawning stream, where recovery was feasible, was included as a primary recovery stream.



The timing of surveys was considered to be the critical factor for successful recovery. Stream escapement records were reviewed to determine peak spawning times. This was accomplished with the assistance of computer programs to summarize escapement records. Tag recovery surveys were scheduled during, and two weeks after, the usual peak spawning time for each stream. Other streams, in addition to the primary recovery systems, were surveyed as time permitted.

A total of thirteen, two-person tag recovery teams were employed to southern Southeastern Alaska. The State of Alaska research vessels KITTIWAKE, SUNDANCE, STELLER, CLUPEA, and CUTTHROAT were utilized for stream survey activities. In addition, teams in Ketchikan and Petersburg consisting of office staff were flown out, as needed, to help complete the survey of primary recovery streams. Tag recovery teams in Canada consisted of Canada Department of Fisheries and Oceans, or LGL Ltd., personnel who drove, flew, or traveled by small boat to reach scheduled recovery streams.

Tagged fish recovery was accomplished with five-pronged spears attached to 12-ft poles or fish pikes. Polarized sunglasses were utilized to eliminate glare and increase visibility. Recovery crews endeavored to examine all dead pink and sockeye salmon to recover tags. In addition, recovery crews counted tags seen on live fish during each survey. This information was used to determine if further surveys were needed. Terminal surveys were conducted on all streams to remove tags from both live and dead salmon.

In-stream tag recovery was also accomplished at eight weirs located in various areas of southern Southeastern Alaska and two weirs in northern British Columbia (Figure 3). Selection of these systems was based on known and potential pink or sockeye salmon escapements and geographical factors.

Commercial catch sampling for Peterson disk tags was also conducted during the 1982 season in several major fishery areas in southern Southeastern Alaska and northern British Columbia. Catch sampling was accomplished by individuals who boarded individual vessels and tenders, or sampled cold storage plants for tags. Samplers looked for tags among fishermen's catches or retrieved tags or tag numbers from fishermen along with their catch statistics.

RESULTS AND DATA ANALYSIS

A series of tag releases and recovery files were established on Apple II microcomputers in the Alaska Department of Fish and Game Ketchikan office, and the Canada Department of Fisheries and Oceans Prince Rupert office. Following completion of the field season, these files were transferred to the Canada Department of Fisheries and Oceans Digital Equipment Corporation VAX computer in Nanaimo, British Columbia, and to the Alaska Department of Fish and Game WICAT microcomputer in Ketchikan for editing, calculation of pink and sockeye salmon interception rates, and the derivation of migration patterns, run timing, and stock intermingling information for both species.

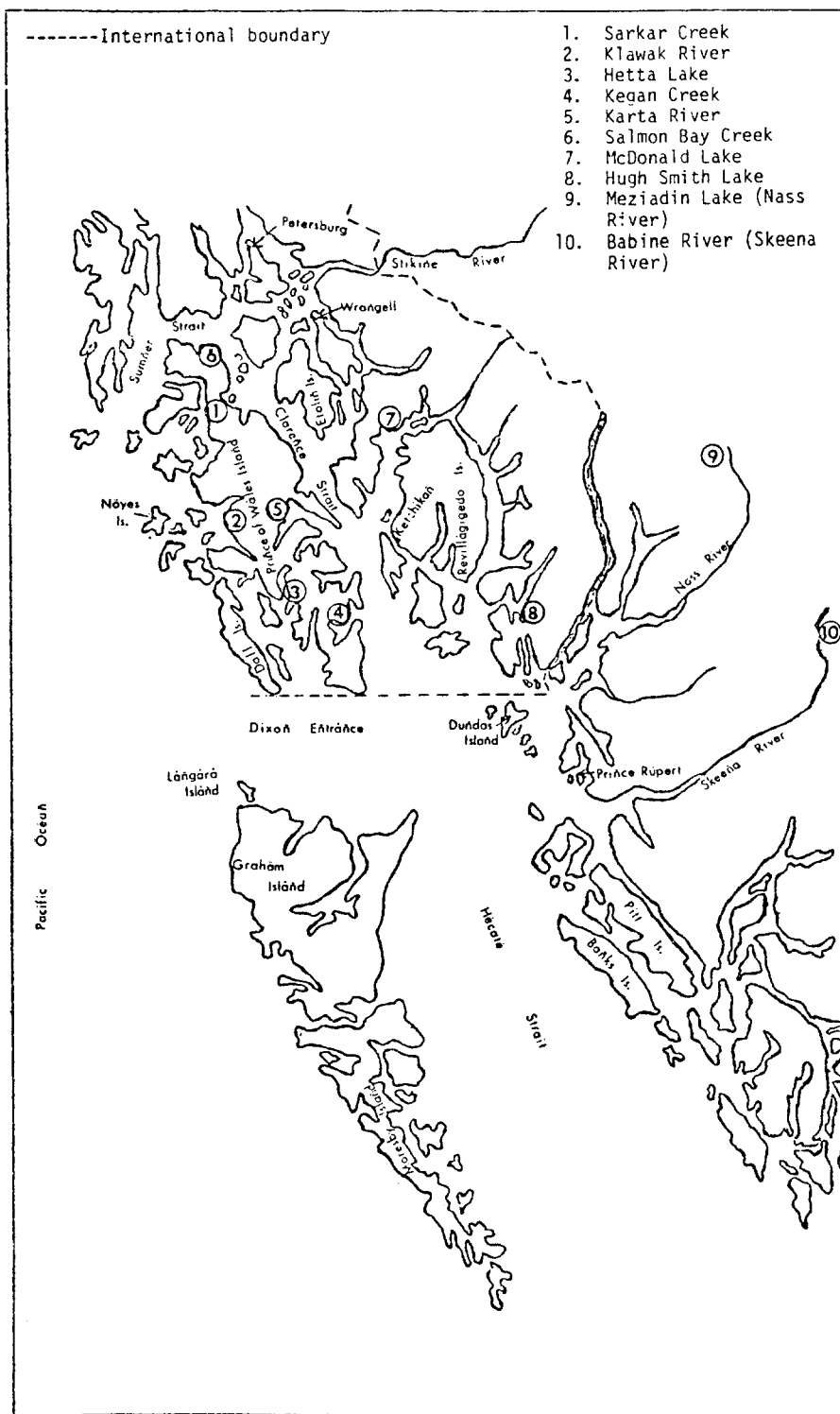


Figure 3. U.S./Canada salmon interception research pink and sockeye salmon weir sites, 1982.

Tag Releases

Southern Southeastern Alaska:

Tagging was initiated on 1 June and continued until 31 August. During this period, a total of 81,838 pink and 8,720 sockeye salmon were tagged and released: 20,013 at Noyes Island (17,200 pink and 2,813 sockeye salmon); 7,190 at Dall Island (5,757 pink and 1,433 sockeye salmon); 19,113 at Tree Point (17,477 pink and 1,636 sockeye salmon); 9,115 in upper Clarence Strait (6,942 pink and 2,173 sockeye salmon); 14,802 in middle Clarence Strait (14,666 pink and 136 sockeye salmon); 13,332 in lower Clarence Strait (12,950 pink and 136 sockeye salmon); 5,635 in Cordova Bay (5,606 pink and 29 sockeye salmon); and 1,348 in Union Bay (1,240 pink and 108 sockeye salmon) (Appendix Table 5). Noyes Island, Dall Island, Tree Point, and Clarence Strait releases were accomplished from early June through late August, while Union Bay releases occurred from early July through early August, and Cordova Bay releases were in August. The number of tagged fish released at any location varied widely depending on weather and the availability of fish.

Northern British Columbia:

Tagging was initiated on 1 June and continued until 15 September in northern British Columbia. During this period, a total of 73,867 pink and 36,875 sockeye salmon were tagged and released: 11,374 at Langara Island (3,465 pink and 7,909 sockeye salmon); 22,835 at Dundas Island (12,749 pink and 10,090 sockeye salmon); 6,683 at Tracy/Boston Rocks (5,610 pink and 1,073 sockeye salmon); 12,765 at Stephens/Porcher Islands (7,128 pink and 5,637 sockeye salmon); 16,861 at Birnie/Maskelyne Islands (12,014 pink and 4,847 sockeye salmon); 9,963 in Area 5-1 (9,473 pink and 490 sockeye salmon); 12,534 in Area 1 (12,487 pink and 47 sockeye salmon); 6,272 in Portland Inlet (4,924 pink and 1,348 sockeye salmon); 4,446 in the Skeena River (2,070 pink and 2,376 sockeye salmon); 223 in Masset Inlet (214 pink and 9 sockeye salmon); 3,049 in the Nass River (0 pink and 3,049 sockeye salmon); 3,146 in Kwinamass Bay (3,146 pink and 0 sockeye salmon); and 587 in Khutzymateen Inlet (all pink salmon) (Appendix Table 5).

Tag Recoveries - Commercial Fisheries Sampling

Southern Southeastern Alaska:

Commercial catch sampling for Peterson disk tags was conducted during the 1982 season in several major fishery areas in southern Southeastern Alaska (Figure 2). Random catch sampling was accomplished by assigning individual employees to various fishery areas (i.e., Tree Point, 101-11). These employees boarded vessels and tenders, and sampled at cold storage plants for tags. Samplers obtained catch figures by species and looked for tags in the fisherman's catch or retrieved tags from crews or vessel skippers. In addition, voluntary tag returns were solicited from fishermen through two lotteries. A lottery with prizes totaling \$2500 was held on 2 August and another on 4 October to encourage voluntary returns. Thus, fishermen were encouraged to turn in as many tags as possible, along with the necessary recovery information, to maximize their chances of winning one of the lottery prizes.

The majority of the commercial recoveries were reported from the southern Southeastern Alaska commercial net fisheries, where approximately 16,700,000 pink and 800,000

sockeye salmon were harvested (Table 3). The majority of the harvest occurred in the District 101-104 seine fisheries. In addition, a large number of tags were returned from the southern Southeastern gill net fisheries where approximately 385,000 pink and 385,000 sockeye salmon were caught. The majority of this harvest occurred in Districts 101 and 106 (Table 3).

Northern British Columbia:

Commercial catch sampling for tags was also conducted in northern British Columbia during the 1982 season in several major fishery areas (Figure 4). Catch sampling was done by personnel from the Canada Department of Fisheries and Oceans or from LGL Ltd. (a consultant firm under contract to Canada) assigned to various fishery areas. These individuals also boarded individual vessels and tenders, and sampled at cold storage plants for tags. Samplers obtained catch figures by species and looked for tags among individual catches, and/or retrieved tags from crew members and vessel skippers. Voluntary returns of tags were also encouraged through lotteries with prizes of \$2500 each in July and September.

The majority of the commercial recoveries in northern British Columbia were reported from the commercial net fisheries where approximately 2,200,000 pink and 2,600,000 sockeye salmon were harvested. The majority of this catch occurred in Areas 1, 3X, 3Y, 3Z, and 4 where 211,000 pink and 1,568,000 sockeye salmon were taken (Table 3).

Tag Recoveries - Spawning Ground Sampling

Southern Southeastern Alaska:

Spawning ground tag recovery efforts were initiated in southern Southeastern Alaska in late July and continued through September. A total of 569 tag recovery surveys were completed in 375 southern Southeastern spawning streams (Appendix Table 6). The majority of these streams were surveyed at least twice with the timing of the surveys considered the critical factor for successful recovery. Stream escapement records were reviewed to determine the peak spawning time and surveys were scheduled during, or two weeks after the usual peak spawning time. In addition, spawning capacities, suitability for recovery, and geographical distribution, were weighed during the final stream survey selection process. The timing of the tag recovery surveys seemed adequate for good escapement coverage, as a comparison of the numbers of pink and sockeye salmon observed during tag recovery efforts and seasonal escapement counts (aerial and foot) indicated substantial proportion of the escapement was examined for tags.

Northern British Columbia:

Spawning ground tag recovery efforts were initiated in northern British Columbia in July and continued through mid-October. A total of 53 tag recovery surveys were completed in 16 northern British Columbia spawning streams (Appendix Table 6). The criteria used for selection of these streams were similar to the factors analyzed for establishing stream survey schedules in Alaska.

Table 3. Southern Southeastern Alaska and northern British Columbia troll and net fisheries catch figures, 1982.

Fishery	Fishing Season	Days Open (In 24 Hour Periods)	Number of Salmon Harvested	
			Pink Salmon	Sockeye Salmon
District 1B Gillnet	June 20-Sept. 19	51.0	341,927	188,753
District 1 Seine	July 3-Sept. 9	22.25	3,864,920	35,276
District 1 Troll	June 1-Sept. 20	102.0	22,216	48
District 2 Seine	July 11-Sept. 9	20.6	1,656,289	22,754
District 2 Troll	June 1-Sept. 20	102.0	7,578	18
District 3 Seine	Aug. 15-Sept. 9	13.37	899,937	1,821
District 3 Troll	June 1-Sept. 20	102.0	11,913	30
Annette Is. Troll	May 15-Aug. 31	228.0		
Annette Is. Seine	July 14-Sept. 3	25.0	494,532	38,541
Annette Is. Gillnet	June 13-Sept. 10	62.5	442	27
Annette Is. Traps	July 1-Sept. 4	33.0	492,661	22,960
District 4 Seine	July 4-Sept. 4	19.63	4,565,028	284,405
District 4 Troll	June 1-Sept. 20	102.0	47,051	272
District 5 Seine	Sept. 2-Sept. 8	4.25	110,697	87
District 5 Troll	June 1-Sept. 20	102.0	11,154	44
District 6A Gillnet (Sumner Strait)	June 13-Sept. 14	21.0	10,117	119,757
District 6A Gillnet (Wrangell Narrows)	Aug. 22-Oct. 13	17.1	673	194
District 6 B&C Gillnet (Upper Clarence Strait)	June 13-Sept. 14	22.0	14,442	69,310
District 6 Seine	Closed	-	-	-
District 6 Troll	June 1-Sept. 20	102.0	9,553	37
District 7A Seine	Closed	-	-	-
District 7B Seine	Aug. 15-Aug. 16	1.6	110,380	308
District 7 Troll	June 1-Sept. 20	102.0	879	3
District 8 Gillnet	June 13-Sept. 14	21.0	17,214	6,553
District 8 Troll	June 1-Sept. 20	102.0	231	0
District 109 Seine	Aug. 6-Sept. 11	6 days	1,610,224	4,124
District 110	Aug. 6-Aug. 28	4 days	2,408,039	4,361
Southeastern Alaska District's 101-110 Total*			16,708,097	799,683

Table 3. Southern Southeastern Alaska and northern British Columbia troll and net fisheries catch figures, 1982 (continued).

Fishery	Fishing Season	Days Open (In 24 Hour Periods)	Number of Salmon Harvested	
			Pink Salmon	Sockeye Salmon
Area 1 Seine	July 4-Aug. 3	Not Available	18,036	58,665
Area 1 Troll	April 15-Sept. 30	Not Available	53,340	3,840
Area 1 Gillnet	July 4-Aug. 3	Not Available	109	819
Area 2E Seine	-Sept. 14	Not Available	1,708	178
Area 2E Troll	April 15-Sept. 30	Not Available	18,535	10,906
Area 2E Gillnet	-Sept. 14	Not Available	43	719
Area 2W Seine	July 4-Sept. 13	Not Available	13,870	9,240
Area 2W Troll	April 15-Sept. 30	Not Available	7,409	6,707
Area 2W Gillnet	July 4-Sept. 13	Not Available	207	504
Area 3X Seine	June 13-Sept. 6	Not Available	404,009	237,195
Area 3X Troll	April 15-Sept. 30	Not Available	22,176	3,682
Area 3X Gillnet	June 13-Sept. 6	Not Available	26,876	41,529
Area 3Y Seine	July 13-Sept. 6	Not Available	159,984	65,025
Area 3Y Troll	April 15-Sept. 30	Not Available	4,175	1,599
Area 3Y Gillnet	July 13-Sept. 6	Not Available	9,582	32,579
Area 3Z Seine	June 13-Sept. 6	Not Available	420,016	91,697
Area 3Z Troll	April 15-Sept. 6	Not Available	4,148	81
Area 3Z Gillnet	June 13-Sept. 6	Not Available	25,687	178,849
Area 4 Seine	July 4-Aug. 9	Not Available	170,255	376,815
Area 4 Troll	April 15-Sept. 30	Not Available	12,750	5,931
Area 4 Gillnet	July 4-Aug. 9	Not Available	149,160	1,314,982

-Continued-

Table 3. Southern Southeastern Alaska and northern British Columbia troll and net fisheries catch figures, 1982 (continued).

Fishery	Fishing Season	Days Open (In 24 Hour Periods)	Number of Salmon Harvested	
			Pink Salmon	Sockeye Salmon
Area 5 Seine	June 27-Aug. 24	Not Available	43,310	25,869
Area 5 Troll	Closed	Not Available	-	-
Area 5 Gillnet	June 27-Aug. 24	Not Available	10,837	22,364
Area 6 Seine	July 11-Aug. 23	Not Available	564,548	69,217
Area 6 Troll	April 15-Sept. 30	Not Available	5,059	1,004
Area 6 Gillnet	July 11-Aug. 23	Not Available	16,222	7,869
Northern British Columbia Total**			2,165,051	2,567,847

* Alaska Department of Fish and Game catch figures are preliminary.

** Canadian Department of Fisheries and Oceans catch figures are preliminary.

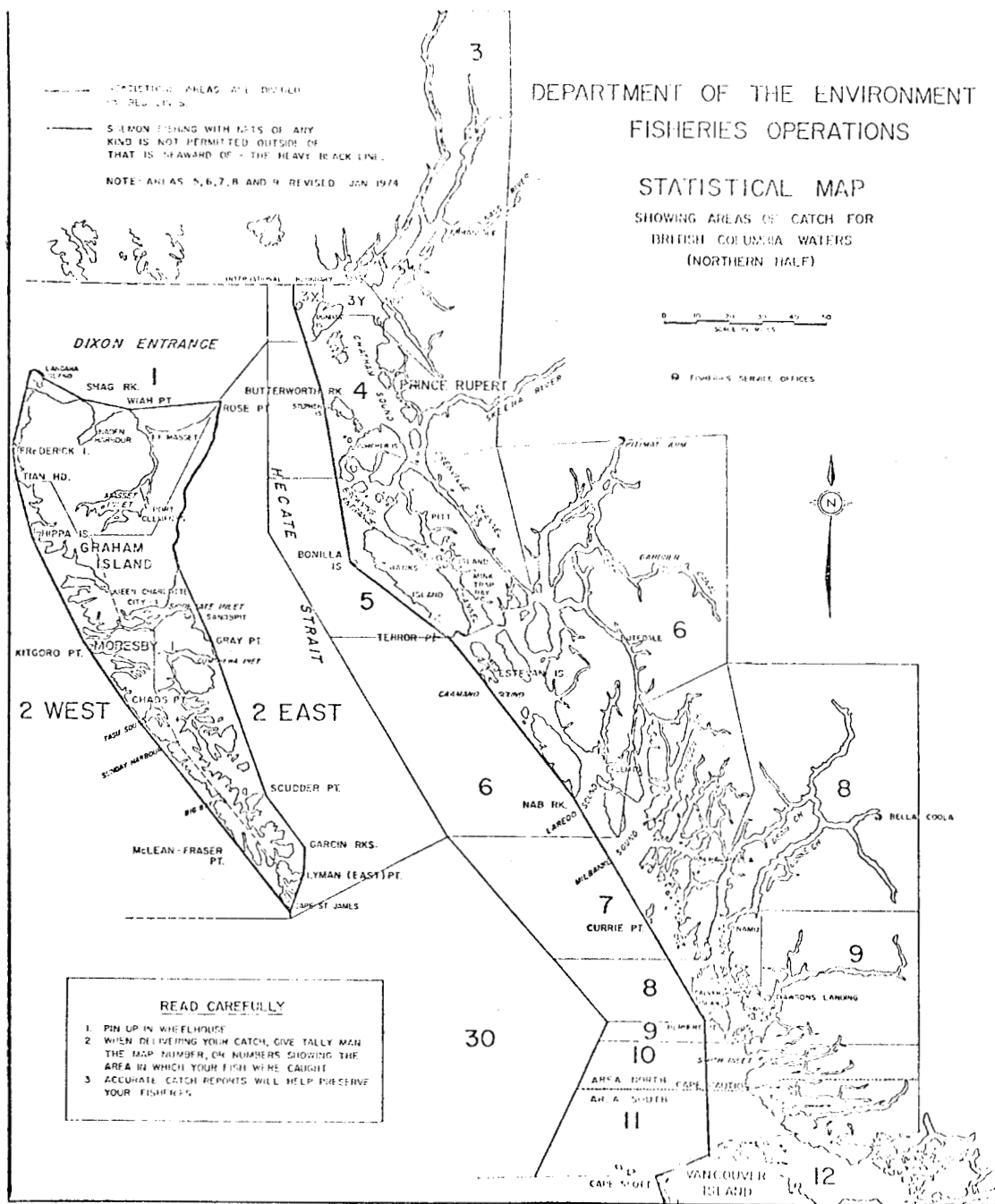


Figure 4. Canadian Department of Fisheries and Oceans fishery management areas.

Weir Sampling and Escapement Enumeration

Southern Southeastern Alaska:

In-stream tag recovery of both pink and sockeye salmon was also accomplished at eight weirs located in various areas of southern Southeastern Alaska. Responsibility for operation of the weirs was divided between the Alaska Department of Fish and Game (Salmon Bay, Klawok River, McDonald Lake, and Hugh Smith Lake) and the southern Southeast Regional Aquaculture Association (SSRAA) (Hetta Lake, Kegan Creek, Sarkar, and Karta River) both of which were under contract to the National Marine Fisheries Service. All weirs were operational by 1 July, and were dismantled by 10 October. Selection of these systems was based on known or potential pink and sockeye escapement indices and geographical distribution (Table 4).

Northern British Columbia:

In-stream tag recovery of both pink and sockeye salmon were also accomplished in northern British Columbia at two major weirs. Canadian Department of Fisheries and Oceans personnel were responsible for operation of these weirs, which were both in operation by early July and continued to operate until late September. Selection of these systems was based upon established weir sites (i.e., Nass and Skeena Rivers) and known escapement indices (Table 4).

Tags Recovered

Southern Southeastern Alaska:

A total of 6,036 pink and 63 sockeye salmon tags (7.0% and 1.0%, respectively, of the Alaskan releases) were recovered from in-stream spawning ground surveys; 746 pink and 695 sockeye salmon tags from the eight Alaskan weirs (1.0% and 8.0%, respectively); and an additional 13,183 pink and 1,473 sockeye salmon tags (17.0% and 17.0%, respectively) were reported from the commercial fisheries. The majority of the pink salmon in-stream recoveries were collected during tag recovery and escapement surveys conducted by Fish and Game personnel, while the majority of sockeye salmon in-stream recoveries came from the eight weirs operated by the Department of Fish and Game or SSRAA. The voluntary tag return program accounted for 10,451 pink and 1,025 sockeye salmon from in-stream, commercial seine, gill net, and troll fishery returns. The random catch sampling program recovered 1,702 pink and 343 sockeye salmon tags from the seine, gillnet, and troll fisheries. In addition, 597 pink and 52 sockeye salmon tag recoveries came from the Annette Island fish traps, while 433 pink and 53 sockeye salmon tag recoveries were of unknown origin (Table 5).

Northern British Columbia:

A total of 522 pink and 76 sockeye salmon tags (1.0% and 0.002%, respectively, of the Canadian releases) were recovered from in-stream spawning ground surveys; 91 pink and 3,045 sockeye salmon tags from the Nass and Skeena River weirs (0.001% and 8.0%, respectively); and an additional 7,544 pink and 10,895 sockeye salmon tags (10.0% and 30.0%, respectively) were reported from the commercial fisheries. The majority of the pink salmon in-stream recoveries were collected during tag recovery and escapement surveys conducted by Canada Department of Fisheries and

Table 4. U.S./Canada research pink and sockeye salmon weir data in southern Southeastern Alaska and northern British Columbia, 1982.

Name	Date of Operation	Cummulative Pink Salmon	Escapement Sockeye Salmon	Number of tags recovered Pink Salmon	Sockeye Salmon	Total
Hugh Smith Lake (101-30-75)	June 14- October 7	9,160	54,436	44	394	438
McDonald Lake (101-30-67)	July 1-September 13	54,759	16,587	247	53	300
Kegan Lake (102-30-67)	June 19-September 22	45,146	14,485	85	34	119
Karta River (102-60-87)	June 24-September 22	72,619	41,963	299	178	477
Hetta Lake (103-25-47)	June 15-August 27	19	5,387	0	13	13
Klawak River (103-60-47)	June 28-October 10	4,403	4,812	2	3	5
Sarkar (103-90-10)	June 14-August 23	7	8,560	0	7	7
Salmon Bay (106-41-10)	June 26-September 2	250	16,041	2	5	7
Alaskan Total		186,363	162,271	679	687	1,366
Babine River	July 11-September 27	280,348	1,193,124 ¹	73	1,799	1,872
Meziadin Lake	June 29-September 12	N/A	245,646 ²	17	1,265	1,282
Canadian Total		280,348	1,438,770	90	3,064	3,154

¹ Includes jack sockeye count of 60,000

² Includes jack sockeye count of 1,160.

Table 5. Number of reported pink and sockeye recoveries by method, southern Southeastern Alaska and northern British Columbia, 1982.

Tag Recovery Method	Number and Percent of Reported Pink Salmon Tag Recoveries		Number and Percent of Reported Sockeye Salmon Tag Recoveries	
Alaska Department of Fish and Game stream recovery	6,036	7.0%	63	1.0%
Volunteer Tag returns ¹	10,451	12.7%	1,025	12.0%
Alaskan Weirs ²	746	1.0%	695	8.0%
Sampled commercial seine fishery	1,463	1.8%	87	1.0%
Sampled commercial gillnet fishery	234	0.003%	256	3.0%
Sampled commercial troll fishery	5	0.00006%	0	0.0%
Annette Island fish traps	597	1.0%	52	0.5%
Miscellaneous or unknown	433	0.5%	53	0.5%
Alaskan Total	19,965		2,231	
Percentage of tags released in Alaska		24.0%		26.0%
Canadian Department of Fisheries and Oceans stream recovery	522	1.0%	76	0.002%
Volunteer tag returns ¹	4,043	5.0%	6,654	18.0%
Canadian Weirs ³	91	0.001%	3,045	8.0%
Sampled commercial seine fishery	2,713	4.0%	940	3.0%
Sampled commercial gillnet fishery	764	1.0%	3,263	9.0%
Sampled commercial troll fishery	6	0.00008%	13	0.0003%
Miscellaneous or unknown	18	0.0002%	25	0.0007%
Canadian Total	8,157		14,016	
Percentage of tags returned in Canada		11.0%		38.0%
Alaskan and Canadian total tags recovered and percentage	28,122	18.1%	16,247	35.6%

¹ Lottery drawings for prizes totaling \$2500 were held twice during the 1982 season in Alaska and Canada to encourage voluntary tag returns.

² Eight Alaskan weirs were operated in 1982.

³ Two Canadian weirs were operated in 1982.

Oceans, or LGL Ltd. personnel under contract for in-stream recovery work. On the other hand, the majority of the sockeye salmon in-stream tag recoveries came from the two weirs operated by the Canada Department of Fisheries and Oceans. The voluntary tag return program also accounted for 4,043 pink and 6,654 sockeye salmon from in-stream, seine, gill net, and troll fishery recoveries. The random catch sampling program recovered 3,483 pink and 4,216 sockeye salmon tags from the seine, gill net, and troll fisheries. In addition, miscellaneous or unknown recoveries accounted for 18 pink and 25 sockeye tags (Table 5).

Distribution of Recoveries

Tagged pink and sockeye salmon were recovered over a widespread area. The majority of the tag recoveries occurred within southern Southeastern Alaska and northern British Columbia waters. Only a few tags were recovered from outside the study areas. These were from Prince William Sound, Yakutat, Haines, and Juneau areas. The distribution of recovered tags strongly suggested that the pink and sockeye salmon which passed through the study area were almost entirely destined for natal streams in southern Southeastern Alaska and northern British Columbia.

Commercial fishery recoveries in southern Southeastern Alaska were mostly from fisheries on the west coast of Prince of Wales Island (Districts 103 and 104) and in Clarence Strait (Districts 101, 102, and 106). Recoveries from these net fisheries indicated that major portions of southern Southeastern Alaska's pink and sockeye salmon return migrated along the west coast of Prince of Wales Island or through Sumner and Clarence Straits. Numerous spawning ground tag recoveries in Districts 105-108 indicated that most of these stocks migrated to their natal streams via Sumner and Clarence Straits. However, the return to Districts 101 and 102 occurred mainly through Dixon Entrance, while the return to Districts 103 and 104 occurred through Dixon Entrance and the many major west coast island entrance passages.

Commercial fishery recoveries in northern British Columbia were mostly from upper Hecate Strait and Portland Inlet (Areas 3X, 3Y, 3Z, and 4). Tag recoveries from these net fisheries indicate that major portions of northern British Columbia pink and sockeye salmon stocks migrate through Dixon Entrance and Sumner, Clarence, and Hecate Straits. In addition, the numerous in-stream recoveries from the Nass and Skeena Rivers (i.e., Meziadin and Babine weirs) indicate that most of these fish also migrate through Dixon Entrance and Sumner, Clarence, and Hecate Straits.

General Migratory Patterns

The results presented are only those of the initial year of tagging in southern Southeastern Alaska and northern British Columbia and should be viewed with a critical eye prior to management application. Additional studies will be required to determine the consistency of migration patterns, run timing, and stock intermingling information. The tagging study should be repeated in 1983, 1984, 1985, and 1986 to compare odd and even-year cycles.

Migration patterns of pink and sockeye salmon that passed through the study area were analyzed using tag returns from the commercial fisheries and stream escapement. The analysis was based on the percentages of the escapement or harvest passing through the release areas in two-week periods (i.e., early, 1-15 June; late 16-30 June, etc.). The percentages were based on the number of tags recovered from each

of the release sites by two-week periods. Separate analyses were performed for movement along each of the southern Southeastern Alaska and northern British Columbia general release locations (Appendix Table 7). Return characteristics were evaluated for each stream and, based on run timing similarities and geographical distribution, various stock groups were identified. The migration patterns of the stock groups were analyzed by combining the recovery information from the various streams within the group and then evaluating group characteristics in the same manner as the individual streams.

Southern Southeastern Alaska:

District 101

Pink Salmon. A total of 11,124 tags were recovered from District 101, including 3,094 from spawning streams; 2,027 from the Tree Point gill net pink salmon harvest of 341,927; 5,593 from the District 101 seine harvest of 3,864,920 pink salmon; and 410 from the Annette Island trap catch of 492,661 pink salmon (Tables 4 and 6). The composition of these recoveries included 1,384 released at Noyes Island; 387 released at Dall Island; 2,859 released near Cape Fox (Tree Point); 255 released in upper Clarence Strait; 1,133 released in middle Clarence Strait; 1,398 released in lower Clarence Strait; 164 released in Cordova Bay; 46 released in Union Bay; 142 released near Langara Island; 996 released near Dundas Island; 549 released near Tracy/Boston Rocks; 76 released near Stephens/Porcher Island; 747 released near Birnie/Maskelyne Island; 128 released in Area 5-1; 709 released in Area 1; 117 released in Portland Inlet; and a total of 3, 18, 10, and 3 tags released in the Skeena River, Masset Inlet, Kwinamass Bay, and Khutzymateen Inlet secondary tag release locations respectively (Appendix Table 8). A review of these figures indicates that this District's pink salmon stocks returned via two pathways. First, it appears that a portion of this District's escapement returned via Sumner and upper Clarence Strait (13% of the tags recovered) and was destined for upper Behm Canal and lower District 101. On the other hand, the majority of this District's escapement (87%) returned via Dixon Entrance with sections of these stocks migrating in a southerly direction into upper Hecate Strait, or a northerly direction into middle Clarence Strait before returning to their natal streams (Figure 5).

Sockeye Salmon. A total of 1,318 sockeye salmon tags were recovered from District 101, including 545 from spawning streams; 521 from the Tree Point gillnet sockeye harvest of 188,753; 250 from this District's seine harvest of 35,276 sockeye salmon; and 22 from the Annette Island trap harvest of 22,960 sockeye salmon (Tables 4 and 7). The composition of these recoveries included 104 releases at Noyes Island, 63 at Dall Island, 189 at Cape Fox (Tree Point), 116 from upper Clarence Strait, 8 from middle Clarence Strait, 44 from lower Clarence Strait, 8 from Union Bay, 250 from Langara Island, 420 from Dundas Island, 18 from Tracy/Boston Rocks, 20 from Stephens/Porcher Islands, 67 from Birnie/Maskelyne Islands, 1 from Area 5-1, 8 from Portland Inlet, and 2 from the Skeena River secondary tagging locations (Appendix Table 8). Again, a review of these figures indicates that District 101 sockeye salmon stocks return via two pathways. First, it is apparent that a portion of this District's sockeye salmon return via Sumner and upper Clarence Strait (9.8% of the tags recovered) with the majority of these fish returning to west Behm Canal and upper District 101 streams. On the other hand, approximately 90% of the District 101 sockeye salmon returned via Dixon Entrance, with a major southerly swing into upper Hecate Strait, before returning to their natal streams in District 101 (Figure 5).

Table 6. Number of Peterson disk tags recovered from pink salmon in southern Southeastern Alaska and northern British Columbia, 1982.

Recovery Location	Gillnet	Recovery Type		Spawning Ground ²	Total
		Ocean ¹ Seine	Trap		
<u>Alaska</u>					
District 101	2,027	5,593	410	3,094	11,124
District 102	0	1,088	-	1,499	2,587
District 103	0	1,076	-	830	1,906
District 104	0	585	-	5	590
District 105	0	0	-	13	13
District 106	219	0	-	660	879
District 107	0	325	-	1,120	1,445
District 108	10	0	-	11	21
District 109	0	56	-	6	62
District 110	0	35	-	7	42
<u>Canada</u>					
Skeena River	122	0	-	237	359
Nass River	29	3	-	19	51
Portland Inlet	0	0	-	282	282
Masset Inlet	0	0	-	9	9
Area 6	0	0	-	9	9

¹ Ocean figures do not include returns with multiple recovery areas, Canadian voluntary returns, and recoveries from outside southern Southeastern Alaska and northern British Columbia.

² Alaskan spawning ground surveys include voluntary recoveries; Canadian figures do not.

Table 7. Number of Peterson disk tags recovered from sockeye salmon in southern Southeastern Alaska and northern British Columbia, 1982.

Recovery Location	Gillnet	Recovery Type		Spawning Ground ²	Total
		Ocean ¹ Seine	Trap		
<u>Alaska</u>					
District 101	521	250	22	545	1,318
District 102	0	49	-	170	219
District 103	0	19	-	36	55
District 104	0	32	-	0	32
District 105	0	0	-	0	0
District 106	133	0	-	14	147
District 107	0	4	-	10	15
District 108	5	0	-	0	5
District 109	0	4	-	0	4
District 110	0	3	-	0	3
<u>Canada</u>					
Skeena River	151	0	-	1,854	2,005
Nass River	70	0	-	1,289	1,359
Portland Inlet	0	0	-	1	1
Masset Inlet	0	0	-	0	0
Area 6	0	0	-	0	0

¹ Ocean figures do not include returns with multiple recovery areas, Canadian voluntary returns, and recoveries from outside southern Southeastern Alaska and northern British Columbia.

² Alaskan spawning ground surveys include voluntary recoveries; Canadian figures do not.

District 102

Pink Salmon. A total of 2,587 pink salmon tags were recovered from District 102, including 1,499 in-stream recoveries and 1,088 from this District's seine harvest of 1,656,289 pink salmon (Tables 4 and 6). The composition of these recoveries included 297 from Noyes Island, 153 from Dall Island, 52 from Cape Fox (Tree Point), 176 from upper Clarence Strait, 432 from middle Clarence Strait, 954 from lower Clarence Strait, 127 from Cordova Bay, 7 from Union Bay, 11 from Langara Island, 33 from Dundas Island, 4 from Tracy/Boston Rocks, 3 from Stephens/Porcher Islands, 5 from Birnie/Maskelyne Islands, 7 from Area 5-1, 311 from Area 1, 12 from Portland Inlet, and 3 from the Masset Inlet secondary tagging locations (Appendix Table 8). A review of these figures indicates that this District's pink salmon stocks also return via two migratory routes. First, it appears that part of these stocks return via Sumner and upper Clarence Strait destined mainly for upper District 102 systems (7% of the tags recovered). On the other hand, the majority of this District's pink salmon stocks return via Dixon Entrance (93% of tags recovered). Upon entering Dixon Entrance, a portion of these fish move into upper Hecate Strait and then reverse their direction of migration to return to District 102 as far north as the confluence of Ernest Sound, in mid-Clarence Strait, before returning to their natal streams (Figure 6).

Sockeye Salmon. A total of 219 sockeye salmon tags were recovered in District 102, including 170 from spawning streams, and 49 from this District's seine harvest of 22,754 sockeye salmon (Tables 4 and 7). The composition of these recoveries included 26 Noyes Island releases, 20 Dall Island, 2 Cape Fox (Tree Point), 105 upper Clarence Strait, 15 middle Clarence Strait, 28 lower Clarence Strait, 4 Union Bay, 10 Langara Island, 6 Dundas Island, 2 Tracy/Boston Rocks, and 1 Birnie/Maskelyne Islands. A review of these figures indicates that District 102 sockeye salmon return via two migratory pathways. First, it is apparent that a large portion of this District's sockeye salmon stocks return via Sumner and upper Clarence Strait (47% of the tags recovered). Nevertheless, it is also apparent that a nearly equal portion of the District 102 sockeye salmon return via Dixon Entrance, with only minor portions migrating into upper Hecate Strait before returning to their natal streams (Figure 6).

District 103

Pink Salmon. A total of 1,905 pink salmon tags were recovered from District 103, including 830 from spawning streams and 1,076 from this District's seine harvest of 899,937 pink salmon (Tables 4 and 6). The composition of these returns consisted of 598 Noyes Island releases, 221 Dall Island releases, 6 Cape Fox (Tree Point) releases, 8 upper Clarence Strait releases, 17 middle Clarence Strait releases, 187 lower Clarence Strait releases, 776 Cordova Bay releases, 6 Langara Island releases, 9 Dundas Island releases, 3 Birnie/Maskelyne Island releases, 1 Area 5-1 release, 73 Area 1 releases, and 1 Portland Inlet release (Appendix Table 8). A review of these figures indicates that the distribution of recoveries from this District was highly varied. Indications are that District 103 pink salmon stocks move inshore through major west coast island passages and Cordova Bay. Nevertheless, a portion of this District's pink salmon stocks also enter upper Hecate and lower Clarence Strait via Dixon Entrance and then reverse their migration direction to return to their natal streams (9.8% of tags recovered). In addition, an even smaller portion (2.2% of tags recovered) circumnavigate Prince

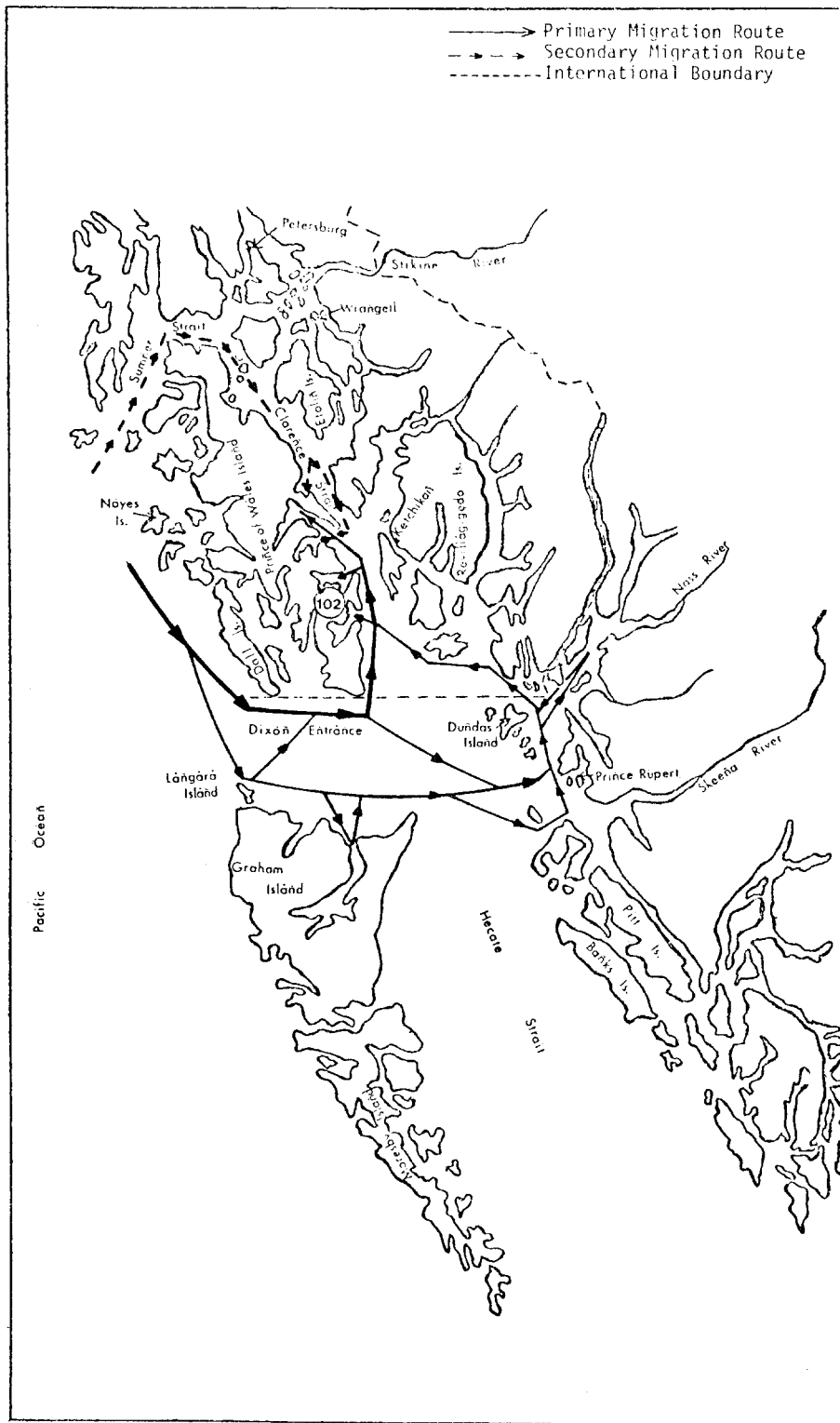


Figure 6. District 102 pink and sockeye salmon migration patterns as indicated by commercial and in-stream recoveries of tagged pink and sockeye salmon released in southern Southeastern Alaska and northern British Columbia, 1982.

of Wales Island via Sumner and Clarence Strait before returning to their spawning streams on the west coast of Prince of Wales Island (Figure 7).

Sockeye Salmon. A total of 55 sockeye salmon tags were recovered in District 103, including 36 in-stream recoveries and 19 from this District's seine harvest of 1,821 sockeye salmon (Table 4 and 7). Noyes Island re-releases represented 22 of the recoveries, Dall Island 15, middle Clarence Strait 1, lower Clarence Strait 3, Cordova Bay 1, and Langara Island 13 (Appendix Table 8). A review of these figures indicates that the District 103 sockeye salmon stocks exhibit migration patterns similar to pink salmon returning to this area. The majority of these stocks move inshore via major west coast passages and Cordova Bay (67% of the tags recovered). A minor portion of this District's sockeye salmon moves into Clarence Strait via Dixon Entrance or circumnavigate Prince of Wales Island (37%) before returning to their natal streams (Figure 7).

District 104

Pink Salmon. A total of 590 pink salmon tags were recovered in District 104, including 5 spawning stream recoveries and 585 recoveries from this District's seine harvest of 4,565,028 pink salmon (Tables 4 and 6). These recoveries included 344 from Noyes Island, 99 from Dall Island, 12 from Cape Fox (Tree Point), 4 from upper Clarence Strait, 16 from middle Clarence Strait, 30 from lower Clarence Strait, 18 from Cordova Bay, 1 from Union Bay, 12 from Langara Island, 4 from Dundas Island, 1 from Tracy/Boston Rocks, 3 from Birnie/Maskelyne Islands, and 46 from Area 1 (Appendix Table 8). Indications are that pink salmon returning to District 104 exhibit migration patterns similar to their District 103 counterparts. The majority of this District's pink salmon stocks move inshore via major west coast island passages or via direct routes to island spawning systems from the Pacific Ocean (75% of tags recovered). On the other hand, a small portion circumnavigate Prince of Wales Island (8.5% of tags recovered) or move into upper Hecate Strait via Dixon Entrance before returning to District 104 natal streams (Figure 7).

Sockeye Salmon. A total of 32 sockeye salmon tags were recovered in District 104, with all of the recoveries reported from this District's seine harvest of 284,405 sockeye salmon (Tables 4 and 7). The composition of these recoveries included 16 Noyes Island, 7 Dall Island, 1 Cape Fox (Tree Point), and 8 Langara Island releases (Appendix Table 8). A review of these figures indicates that the majority of this District's sockeye salmon move inshore from the Pacific Ocean via major west coast island passages, or directly to spawning streams emptying into the Pacific Ocean (97% of tags recovered). Nevertheless, a small portion of this District's sockeye salmon stocks also move into the lower Revillagigedo Channel area near Tree Point via Dixon Entrance prior to reversing their migrations and moving back out to District 104 streams on the west coast of Dall, Sumner, Baker, and Noyes Islands (Figure 8).

District 105

Pink Salmon. A total of 13 pink salmon tags were recovered from District 105, with all of these reported as in-stream recoveries (Table 6). No recoveries were reported from this District's seine harvest of 110,699 pink salmon (Table 4). The composition of these recoveries included five Noyes Island, three Dall Island, three lower Clarence Strait, one Cordova Bay, and one from Area 1 (Appendix Table 8).

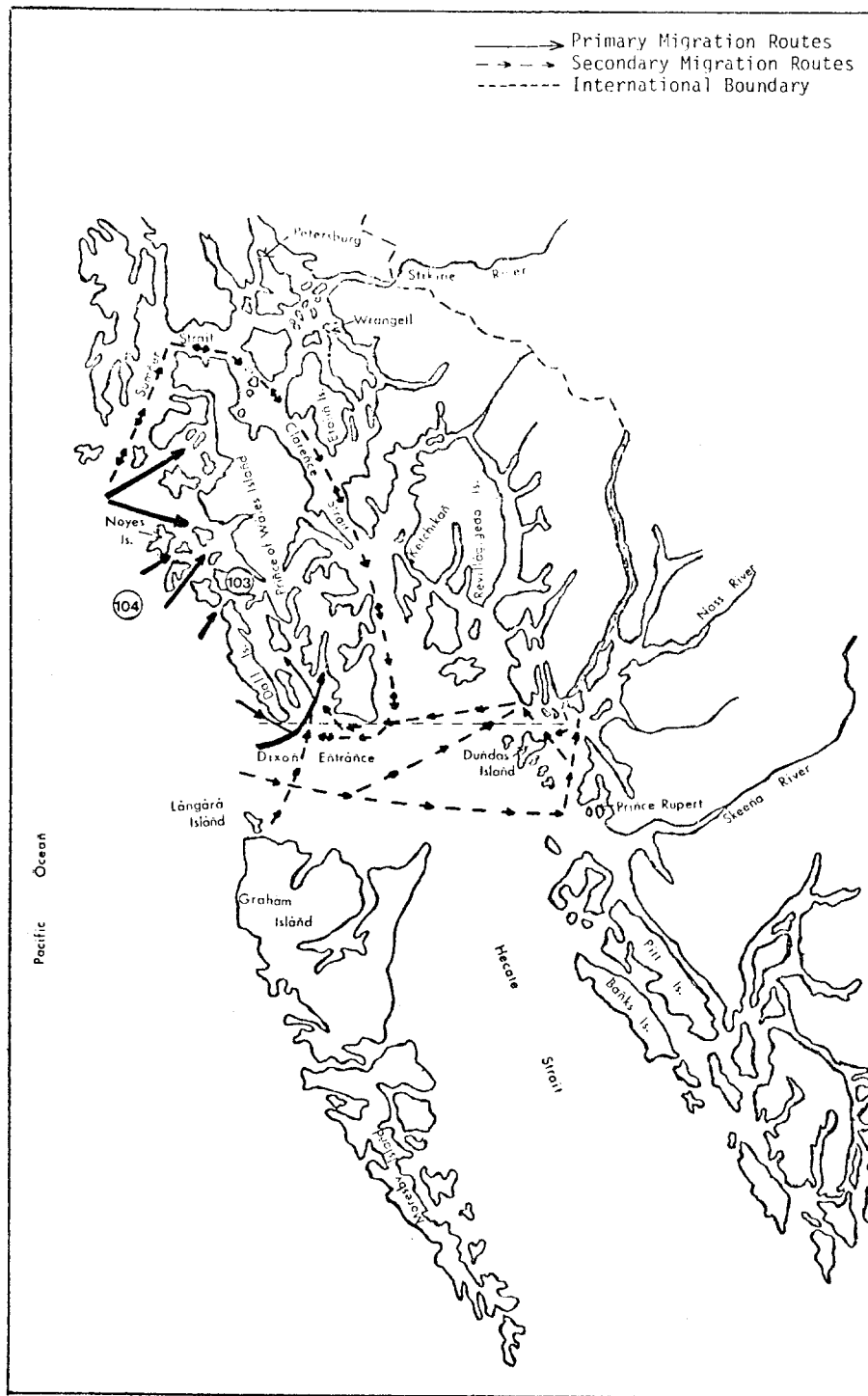


Figure 7. District 103 pink and sockeye salmon and District 104 pink salmon migration patterns as indicated by commercial and in-stream recoveries of tagged pink and sockeye salmon released in southern South-eastern Alaska and northern British Columbia, 1982.

Due to the limited number of tags and varied release sites, complete identification of this District's pink salmon migration patterns is impossible. All that can be noted is that a major portion of this District's pink salmon return through lower Sumner Strait (Figure 9). Any other conclusions based on the recoveries from lower Clarence Strait, Area 1, and Cordova Bay, would be based on conjecture and not verifiable. Additional tagging in these areas is necessary to determine if District 105 stocks do migrate through these areas to any great extent, or if this year's recoveries are anomalous.

Sockeye Salmon. No sockeye salmon tag recoveries were reported from District 105 during the 1982 field season. This may be a function of the limited number of sockeye systems in this District, or an artifact of the 1982 tag release locations. Additional tagging in future years will be needed in order to investigate this recovery question.

District 106

Pink Salmon. A total of 879 pink salmon tags were recovered from District 106, including 660 spawning stream recoveries and 219 recoveries from this District's gill net harvest of 25,232 pink salmon (Tables 4 and 6). The composition of these recoveries included 76 Noyes Island, 25 Dall Island, 4 Cape Fox (Tree Point), 237 upper Clarence Strait, 266 middle Clarence Strait, 153 lower Clarence Strait, 42 Cordova Bay, 8 Union Bay, 2 Langara Island, 2 Dundas Island, 3 Area 5-1, 57 Area 1, and 4 Portland Inlet (Appendix Table 9). A review of these figures indicates that District 106 pink salmon stocks return via two migratory routes. First, a major portion of these stocks enter through Sumner Strait, migrate around the north end of Prince of Wales Island, and then move into the spawning stream in the upper Clarence Strait portion of District 106 (36% of the tags recovered). The remaining portion of this District's pink salmon stocks move inshore through Dixon Entrance, move into upper Hecate Strait and then migrate up through lower and middle Clarence Strait to the District 106 natal streams (Figure 10).

Sockeye Salmon. A total of 147 sockeye salmon tags were recovered in District 106, including 14 in-stream recoveries and 133 recoveries from this District's gill net harvest of 189,261 (Tables 4 and 7). The composition of these recoveries included 77 Noyes Island releases, 2 Dall Island releases, 1 Cape Fox (Tree Point) release, 60 upper Clarence Strait releases, 1 middle Clarence Strait release, 1 lower Clarence Strait release, 4 Langara Island releases, and 1 Birnie/Maskelyne Island release (Appendix Table 9). The migration patterns of this District's sockeye salmon appear to be similar to those of pink salmon stocks. A major portion of this District's sockeye salmon return via lower Sumner Strait, migrate around the north end of Prince of Wales Island, and then turn south into upper Clarence Strait natal streams (89% of the tags recovered). The remaining portion (11%) of this District's sockeye salmon move inshore via Dixon Entrance and then migrate up through lower and middle Clarence Strait to the spawning streams in District 106 (Figure 10).

District 107

Pink Salmon. A total of 1,445 pink salmon tags were recovered from District 107, including 1,120 in-stream recoveries and 325 recoveries from this District's seine harvest of 110,380 pink salmon (Tables 4 and 6). The composition of these recov-

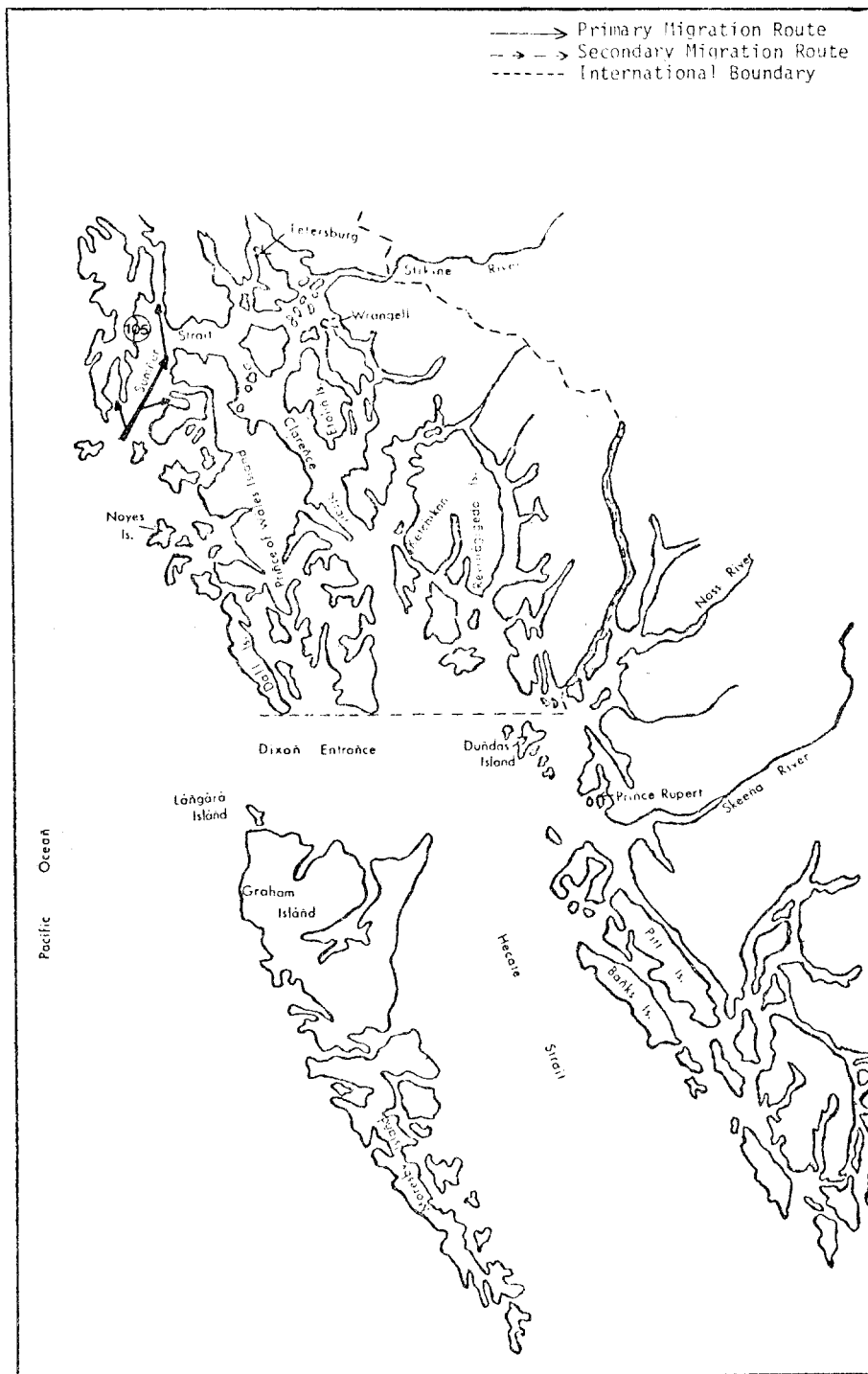


Figure 9. District 105 pink salmon migration patterns as indicated by commercial and in-stream recoveries of tagged pink salmon released in southern Southeastern Alaska and northern British Columbia, 1982.

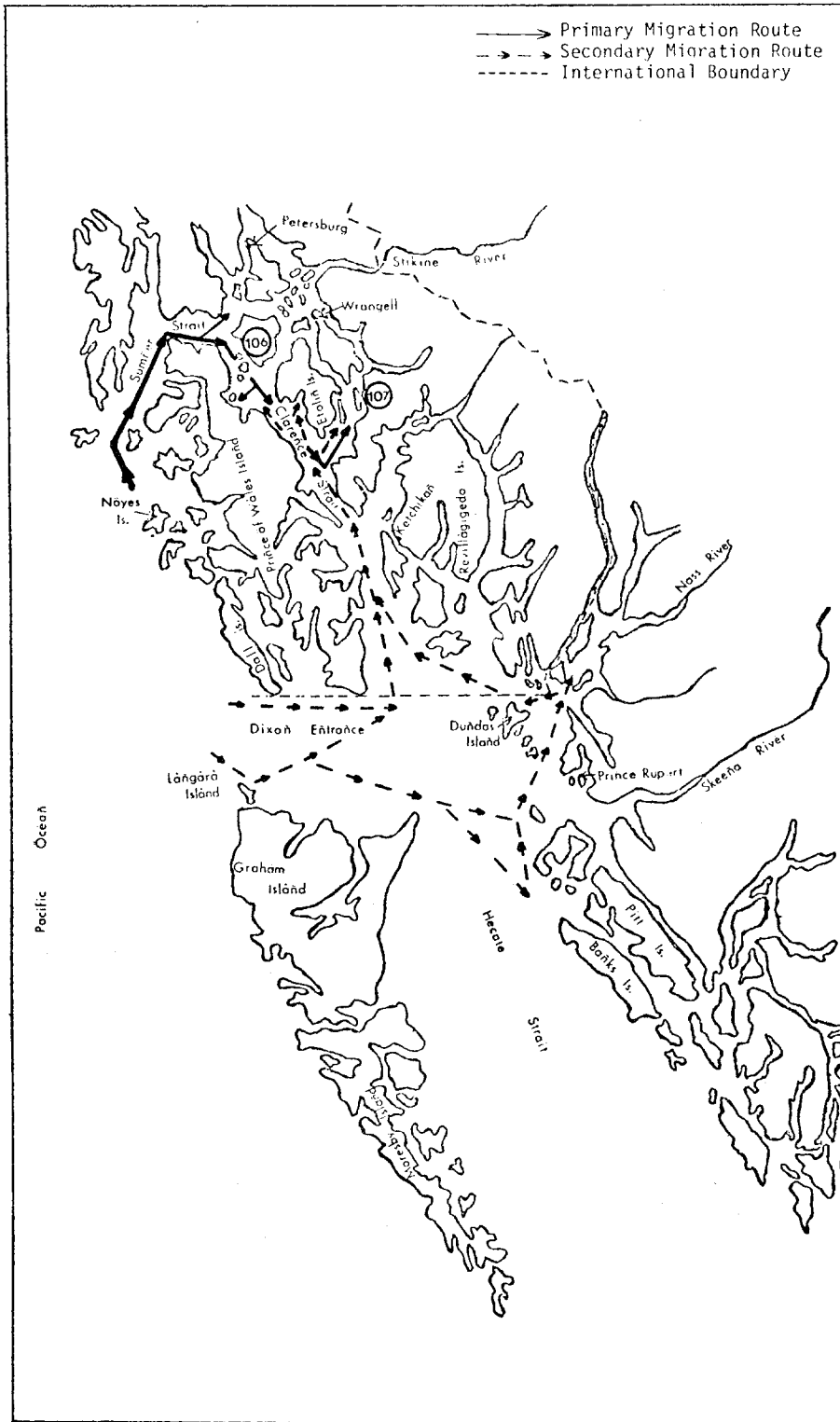


Figure 10. District 106 and 107 pink and sockeye salmon migration patterns as indicated by commercial and in-stream recoveries of tagged pink and sockeye salmon released in southern Southeastern Alaska and northern British Columbia, 1982.

eries included 65 Noyes Island, 35 Dall Island, 17 Cape Fox (Tree Point), 201 upper Clarence Strait, 775 middle Clarence Strait, 166 lower Clarence Strait, 17 Cordova Bay, 72 Union Bay, 4 Langara Island, 3 Dundas Island, 1 Birnie/Maskelyne Island, 4 Area 5-1, 82 Area 1 and 3, and Portland Inlet releases (Appendix Table 8). A review of these figures indicates that this District's pink salmon stocks return via two migratory routes. First, the majority of this District's pink salmon return through lower Sumner Strait, migrate around the north end of Prince of Wales Island, and then turn south through upper and middle Clarence Strait before moving into their natal streams in the Ernest Sound and Bradfield Canal sections of District 107 (66% of the tags recovered). A smaller portion of this District's pink salmon migrate inshore through Dixon Entrance and mill as far inshore as upper Hecate Strait before turning north into lower and middle Clarence Strait where they then move up into District 107's Ernest Sound and Bradfield Canal (34% of the tags recovered -- Figure 10).

Sockeye Salmon. A total of 14 sockeye salmon tags were recovered in District 107, including 10 in-stream recoveries and 4 recoveries from this District's seine harvest of 308 sockeye salmon (Tables 4 and 7). The composition of these recoveries included two Noyes Island, two Dall Island, eight upper Clarence Strait, one lower Clarence Strait, and one Langara Island release (Appendix Table 9). Given the limited number of recoveries, it appears that this District's sockeye salmon return mainly through one migratory pathway. The majority of this district's sockeye salmon (93% of the tags recovered) return via lower Sumner Strait, migrate around the north end of Prince of Wales Island, turn south into Clarence Strait, and then move to their natal streams in the Ernest Sound and Bradfield Canal portion of District 107. Based on an extremely limited recovery of one tag, it appears that a portion of this District's sockeye salmon also return via lower Clarence Strait. Additional tagging of sockeye salmon in lower Clarence Strait in future years is needed for verification of this migratory route (Figure 10).

District 108

Pink Salmon. A total of 21 pink salmon tags were recovered in District 108, including 11 in-stream recoveries and 10 recoveries from this District's gill net harvest of 17,214 pink salmon (Tables 4 and 6). The composition of these recoveries included 6 Noyes Island, two Dall Island, 8 upper Clarence Strait, two middle Clarence Strait, one lower Clarence Strait, one Union Bay, and one Area 1 recoveries (Appendix Table 8). These figures indicate that this District's pink salmon stocks return via two migratory pathways. First, the majority of this District's pink salmon return via Sumner Strait and Stikine Straits (76% of the tags recovered). A smaller portion (24%) of the pink salmon stocks return via Dixon Entrance, Clarence Strait, and then through Stikine and/or Sumner Strait waters (Figure 11).

Sockeye Salmon. A total of five sockeye salmon tags were recovered in District 108, with all of these tags reported as in-season recoveries (Table 7). No recoveries were reported from this District's gill net harvest of 6,553 sockeye salmon (Table 4). The composition of these recoveries included four from Noyes Island and one from upper Clarence Strait. Due to the limited number of recoveries in this district, it would be impossible to state conclusively what migratory pathway sockeye salmon use to return to this District. Further tagging of sockeye salmon in Sumner and Clarence Strait will be necessary.

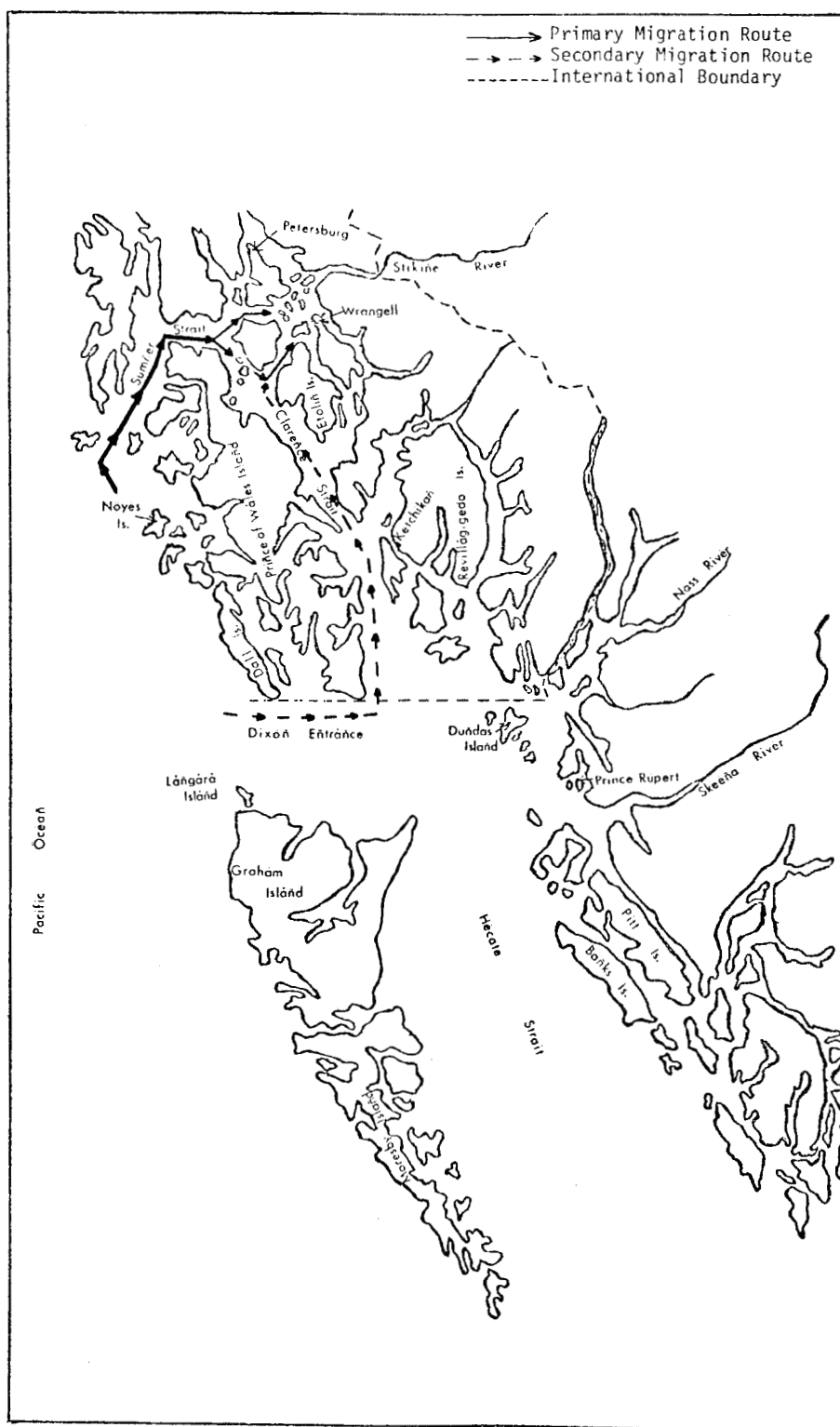


Figure 11. District 108 pink salmon migrations as indicated by commercial and in-stream recoveries of tagged pink salmon released in southern Southeastern Alaska and northern British Columbia, 1982.

District 109

Pink Salmon. A total of 62 pink salmon tags were recovered in District 109, including 6 spawning stream recoveries and 57 recoveries from this District's seine harvest of 1,610,224 pink salmon (Tables 4 and 6). The composition of these recoveries included 10 Noyes Island, 8 Dall Island, 1 Cape Fox (Tree Point), 6 upper Clarence Strait, 7 middle Clarence Strait, 9 lower Clarence Strait, 7 Langara Island, and 14 Area 1 releases (Appendix Table 9). A review of these figures indicates that a portion of the District 109 pink salmon stocks enter from a southerly direction via several migratory pathways. First, part of these stocks return via lower Chatham Strait or move inshore through lower Sumner Strait, migrate past the north end of Prince of Wales Island and then continue on to the lower District 109 natal streams via Rocky Pass, Wrangell Narrows, and Dry Strait (38% of the tags recovered). The remaining portion of these stocks move inshore through Dixon Entrance, migrate up through Clarence Strait, and then move on to lower District 109 streams via Wrangell Narrows and Dry Strait (Figure 12). Additional in-depth tagging in Sumner Strait, Rocky Pass, Wrangell Narrows, and Dry Strait is necessary to confirm these migratory pathways and/or to determine if one of them is a primary route of return for these stocks.

Sockeye Salmon. A total of four sockeye salmon tags were recovered in District 109, with all of the recoveries reported from this District's seine harvest of 4,142 sockeye salmon (Tables 4 and 7). Due to the limited number of tag recoveries in this District, it would be impossible to make any conclusions on migratory patterns for this District's sockeye stocks. The only statement which can be made is that this District's sockeye salmon may follow migratory routes similar to those of pink salmon returning to District 109. Only in-depth and extensive sockeye salmon tagging in future years will provide information on the migratory patterns of sockeye salmon returning to District 109.

District 110

Pink Salmon. A total of 42 pink salmon tags were recovered from District 110, including 7 in-stream recoveries and 35 recoveries from this District's seine harvest of 2,408,039 pink salmon (Tables 4 and 6). The composition of these recoveries included 10 Noyes Island, 2 Dall Island, 12 upper Clarence Strait, 6 middle Clarence Strait, 1 lower Clarence Strait, 3 Langara Island, and 8 Area 1 recoveries (Appendix Table 9). A review of these figures indicates that District 110 pink salmon stocks exhibit migratory patterns similar to those derived for District 109 pink salmon stocks. First, it appears that a portion of this District's pink salmon migrate through lower Chatham or Sumner Strait, Rocky Pass, Wrangell Narrows, and Dry Strait as they return to their natal streams (52% of the tags recovered). On the other hand, the remaining portion of these stocks move inshore through Dixon Entrance, turn north and migrates up Clarence Strait, and then move on to District 110 natal streams via Rocky Pass, Wrangell Narrows, and Dry Straits (Figure 12). Again, additional in-depth tagging of pink salmon in lower Chatham Strait, near Noyes Island, and in Sumner and Clarence Strait will be necessary to confirm these patterns or to detect a preferred migratory route used by these stocks.

Sockeye Salmon. A total of three sockeye salmon tags were recovered in District 110, with all of the recoveries reported from this District's seine harvest of

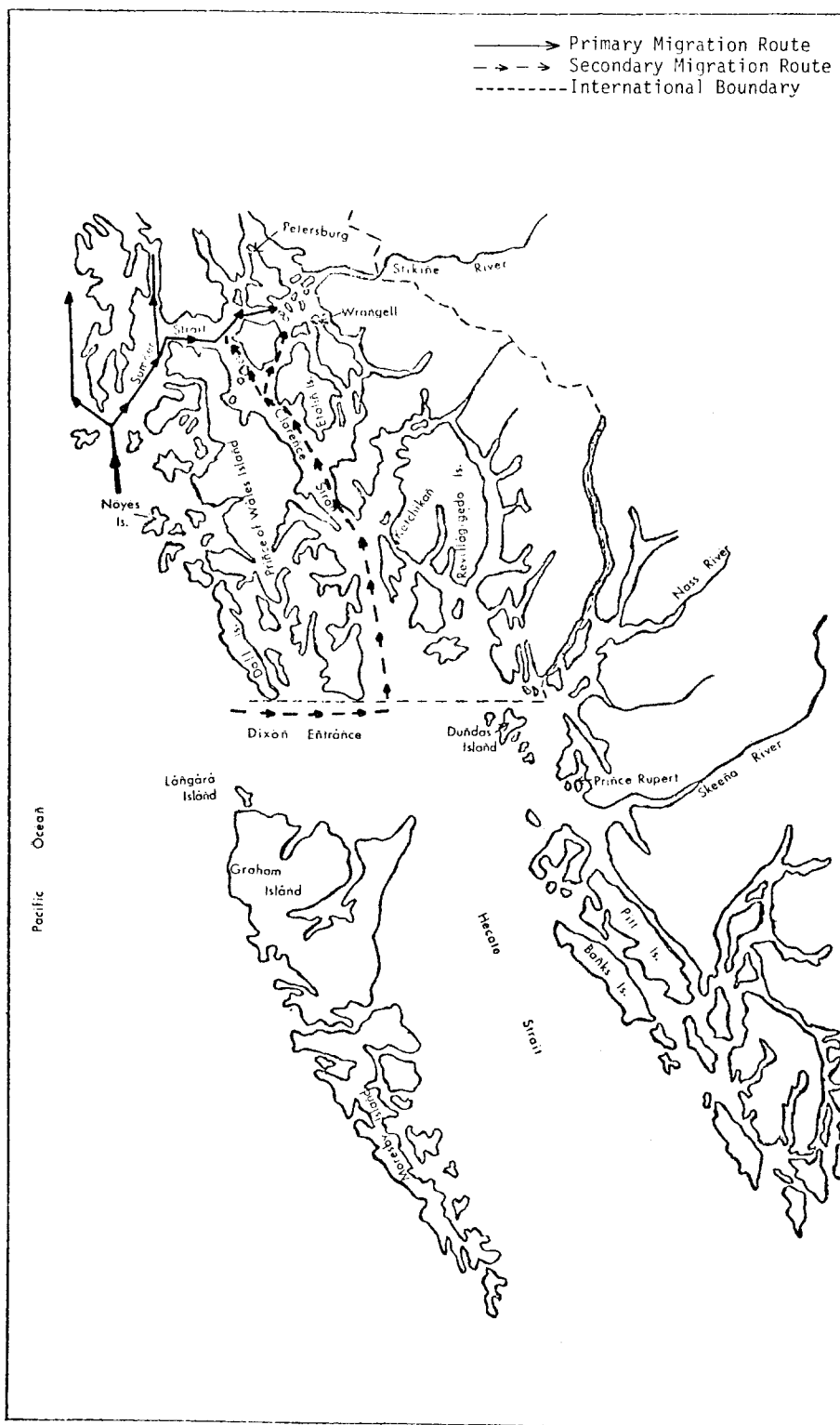


Figure 12. Lower District 109 and 110 pink salmon migrations as indicated by commercial and in-stream recoveries of tagged pink salmon released in southern Southeastern Alaska and northern British Columbia, 1982.

4,361 sockeye salmon (Tables 4 and 7). Due to the extremely limited number of sockeye tags recovered in this District, very little can be stated concerning the migratory routes used by these stocks. Additional tagging in future years will be necessary if any concrete conclusions are to be derived concerning District 110 sockeye salmon migration patterns.

Northern British Columbia:

Skeena River

Pink Salmon. A total of 359 pink salmon tags were recovered in the Skeena River in northern British Columbia, including 237 spawning ground and 122 lower river commercial gill net recoveries (Table 6). The tag recoveries within this system were comprised of 8 Noyes Island, 6 Dall Island, 5 Cape Fox (Tree Point), 2 upper Clarence Strait, 3 middle Clarence Strait, 1 lower Clarence Strait, 1 Cordova Bay, 2 Langara Island, 47 Dundas Island, 2 Tracy/Boston Rocks, 134 Stephens/Porcher Island, 32 Birnie/Maskelyne Island, 71 Area 5-1, 13 Area 1, 30 Skeena River secondary tagging and 2 Masset Inlet secondary tagging releases (Appendix Table 10). A review of these figures indicates that the pink salmon stocks returning to the Skeena River exhibit three migratory pathways. First, the major portion of these stocks enter the Skeena River from a southerly direction via lower Hecate Strait (66% of the tags recovered). Secondly, another portion of these stocks enter through Dixon Entrance, moves into upper Hecate Strait, and then migrates into the Skeena River (27% of the tags recovered). Finally, a minor portion of these stocks moves inshore through lower Sumner Strait, moves around the north end of Prince of Wales Island, turns south into Clarence Strait and then moves into Hecate Strait and the Skeena River (7% of the tags recovered -- Figure 13).

Sockeye Salmon. A total of 2,005 sockeye salmon tags were recovered in the Skeena River during 1982, including 1,854 spawning ground and 151 lower river commercial gill net recoveries. The composition of these recoveries included 70 Noyes Island, 26 Dall Island, 18 Cape Fox (Tree Point), 37 upper Clarence Strait, 2 middle Clarence Strait, 2 lower Clarence Strait, 3 Union Bay, 269 Langara Island, 567 Dundas Island, 13 Tracy/Boston Rocks, 530 Stephens/Porcher Island, 57 Birnie/Maskelyne Island, 63 Areas 5-1, 9 Portland Inlet, and 339 Skeena River secondary tagging releases (Appendix Table 10). These figures indicate that sockeye salmon returning to the Skeena River, use three different migratory routes. First, the majority of these fish move inshore through Dixon Entrance, enter upper Hecate Strait, and then move into the Skeena River (77% of the tags recovered). Another portion of these stocks moves inshore through Sumner Strait, migrates around the north end of Prince of Wales Island into Clarence Strait, migrates south through Clarence Strait into upper Hecate Strait, and then moves up the Skeena River (3% of the tags recovered). Finally, the remaining portion of these stocks migrates inshore via lower Hecate Strait and move up into the Skeena River (20% of the tags recovered -- Figure 14).

Nass River

Pink Salmon. A total of 51 pink salmon tags were recovered from the Nass River during the 1982 field season, including 32 from the lower river commercial gill net and seine test fishery, and 19 spawning ground recoveries (Table 6). The composition of these recoveries included 3 Noyes Island, 5 Cape Fox (Tree Point), 23 upper Clarence Strait, 1 Langara Island, 3 Dundas Island, 1 Tracy/Boston Rocks,

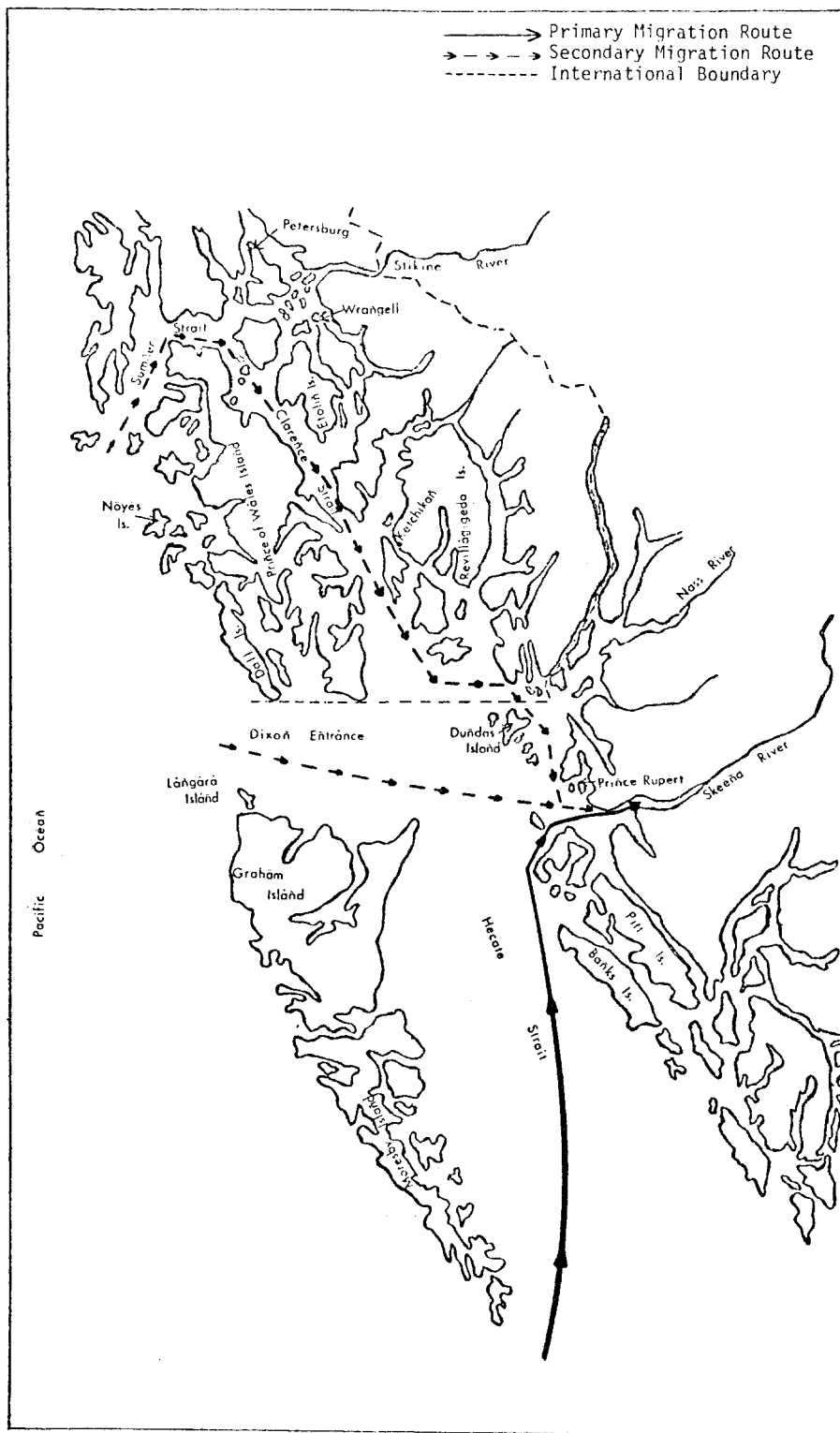


Figure 13. Skeena River pink salmon migration patterns as indicated by commercial and in-stream recoveries of tagged pink salmon released in southern Southeastern Alaska and northern British Columbia, 1982.

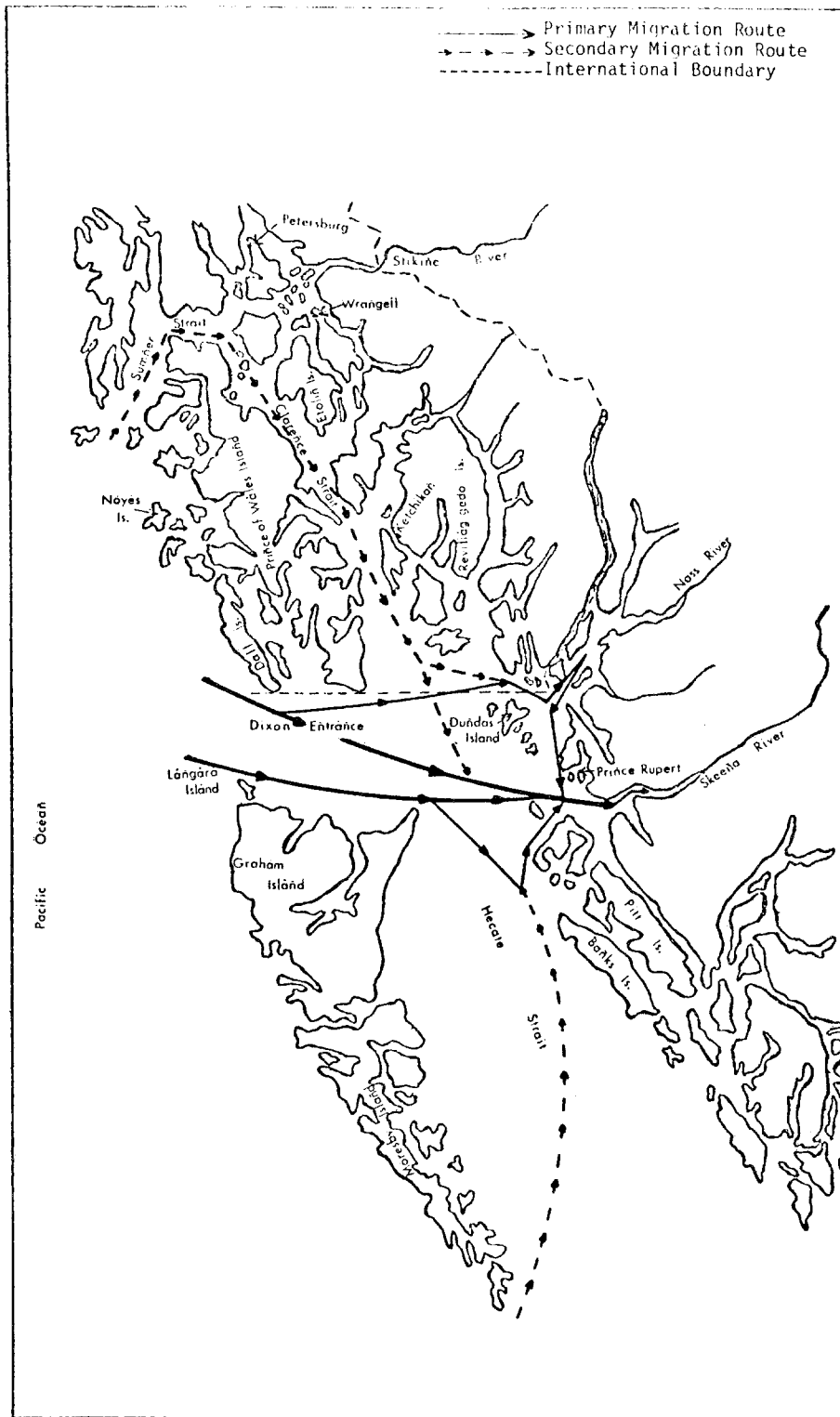


Figure 14. Skeena River sockeye salmon migration patterns as indicated by commercial and in-stream recoveries of tagged sockeye salmon released in southern Southeastern Alaska and northern British Columbia, 1982.

4 Birnie/Maskelyne Island, 6 Area 5-1, 2 Area 1, and 3 Portland Inlet releases (Appendix Table 10). A review of these figures indicates that Nass River pink salmon return to this system via two migratory routes. First, a major portion of this river's pink salmon moves inshore through lower Sumner Strait, migrates around the north end of Prince of Wales Island into upper Clarence Strait, and continues south through Clarence Strait and into upper Hecate Strait, as far south as Browning Entrance, before returning to the Nass River. The remaining portion of these stocks moves inshore through Dixon Entrance into lower Revillagigedo Channel and upper Hecate Strait before migrating up Portland Inlet into the Nass River (Figure 15).

Sockeye Salmon. A total of 1,359 sockeye salmon tags were recovered in the Nass River during 1982, including 70 from the lower river gillnet fishery, and 1,289 spawning ground surveys (Table 7). Noyes Island releases represented 52 of these recoveries, Dall Island 30, Cape Fox (Tree Point) 84, upper Clarence Strait 7, lower Clarence Strait 10, Langara Island 117, Dundas Island 238, Tracy/Boston Rocks 133, Stephens/Porcher Island 6, Birnie/Maskelyne Islands 587, Portland Inlet 92, and the Skeena River secondary tagging 3 (Appendix Table 10). These figures indicate that Nass River sockeye salmon return via one major and one minor migratory route. First, the majority of these stocks move inshore through Dixon Entrance into lower Revillagigedo Channel and upper Hecate Strait prior to migrating up Portland Inlet and into the Nass River (92% of the tags recovered). The remaining portion of these stocks (8% of the tags recovered), move inshore through lower Sumner Strait, migrate around the north end of Prince of Wales Island into Clarence Strait, and then move south through Clarence Strait and into upper Hecate Strait prior to moving up Portland Inlet and into the Nass River (Figure 16).

Portland Inlet (excluding Nass River)

Pink Salmon. A total of 282 pink salmon tags were recovered in Portland Inlet; all were reported as in-stream recoveries. No recoveries were reported from this area's seine harvest of 420,016 and gill net harvest of 25,687 pink salmon, respectively (Tables 4 and 6). The composition of these recoveries included 2 from Noyes Island, 15 from Cape Fox (Tree Point), 3 from Langara Island, 21 from Dundas Island, 23 from Tracy/Boston Rocks, 5 from Stephens/Porcher Island, 51 from Birnie/Maskelyne Islands, 4 from Area 5-1, 4 from Area 1, 54 from Portland Inlet, 93 from the Kwinamass secondary tagging locations, and 7 from the Khutzymateen secondary tagging locations (Appendix Table 10). A review of these figures indicates that Portland Inlet pink salmon stocks return via one major migratory route. Pink salmon destined for Portland Inlet move inshore through Dixon Entrance, enter lower Revillagigedo Channel and upper Hecate Strait, and then migrate into Portland Inlet to their natal streams (Figure 17).

Sockeye Salmon. Only one sockeye salmon tag was recovered in Portland Inlet. Due to the limited number of recoveries, very little can be stated concerning this area's sockeye salmon migratory patterns.

Additional tagging in future years may provide more insight concerning these stocks.

Masset Inlet (Yakoun River)

Pink Salmon. A total of nine pink salmon tags were recovered from the Yakoun River, in Masset Inlet, during 1982 (Table 6). The composition of these recoveries

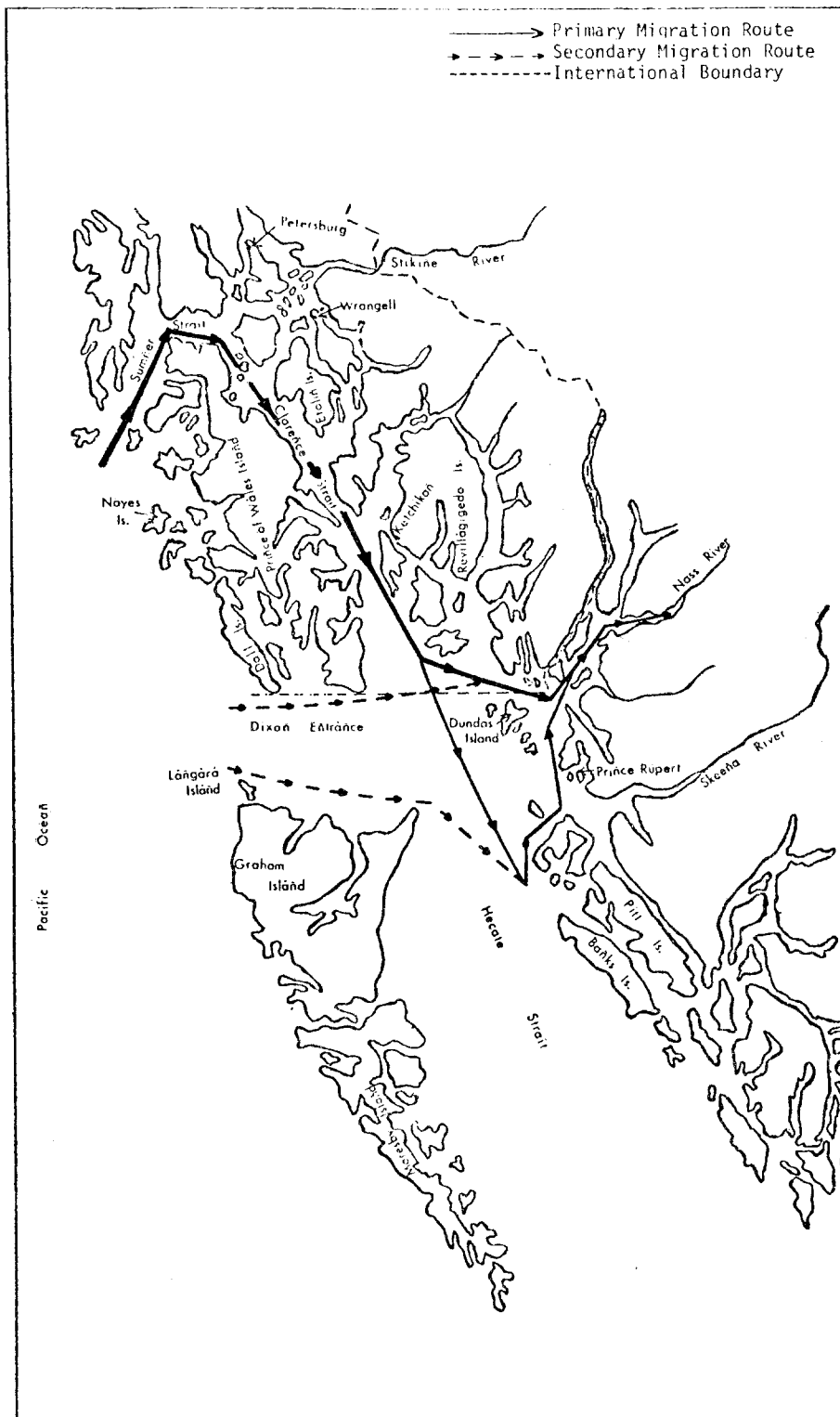


Figure 15. Nass River pink salmon migration patterns as indicated by commercial and in-stream recoveries of tagged pink salmon released in southern Southeastern Alaska and northern British Columbia, 1982.

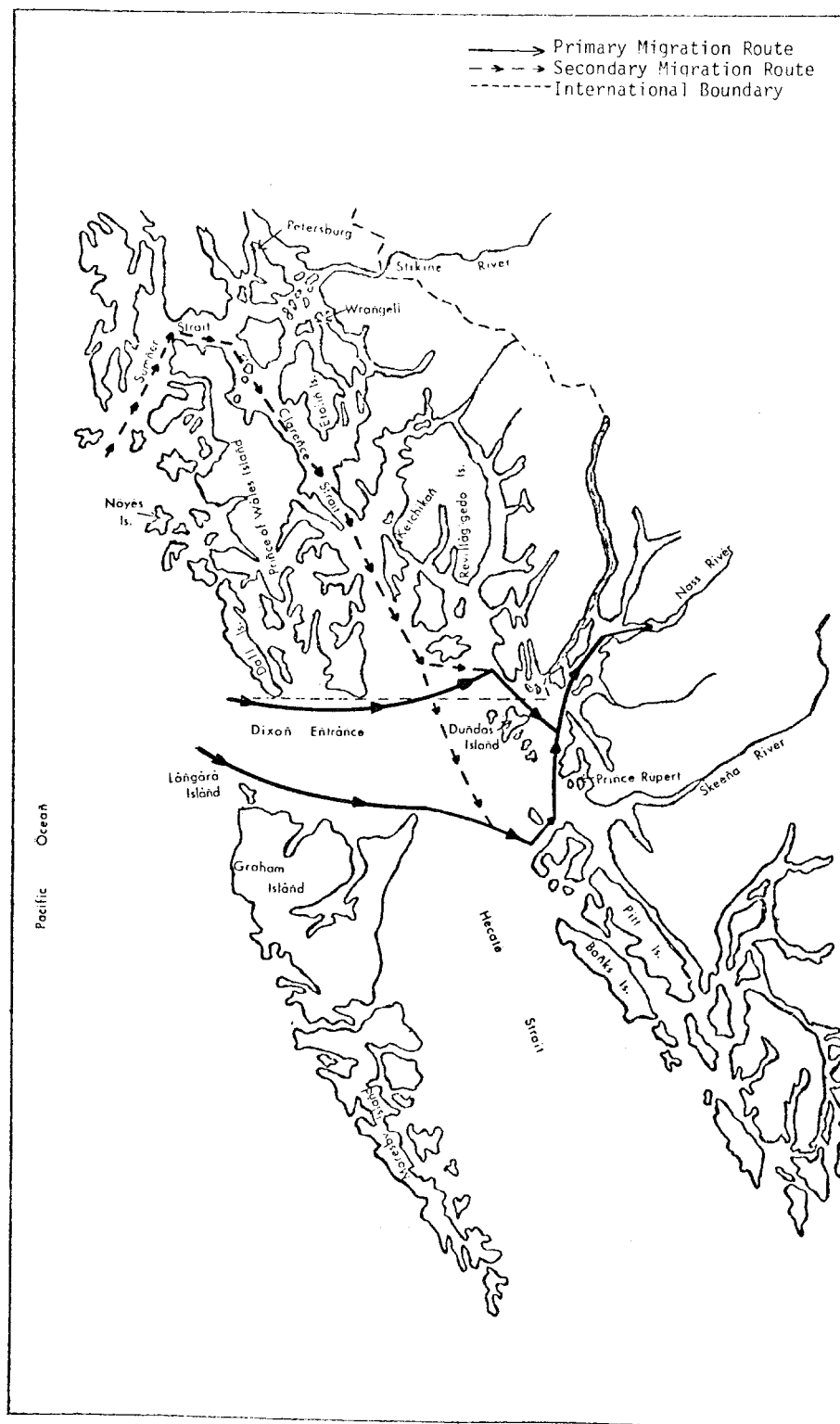


Figure 16. Nass River sockeye salmon migration patterns as indicated by commercial and in-stream recoveries of tagged sockeye salmon released in southern Southeastern Alaska and northern British Columbia, 1982.

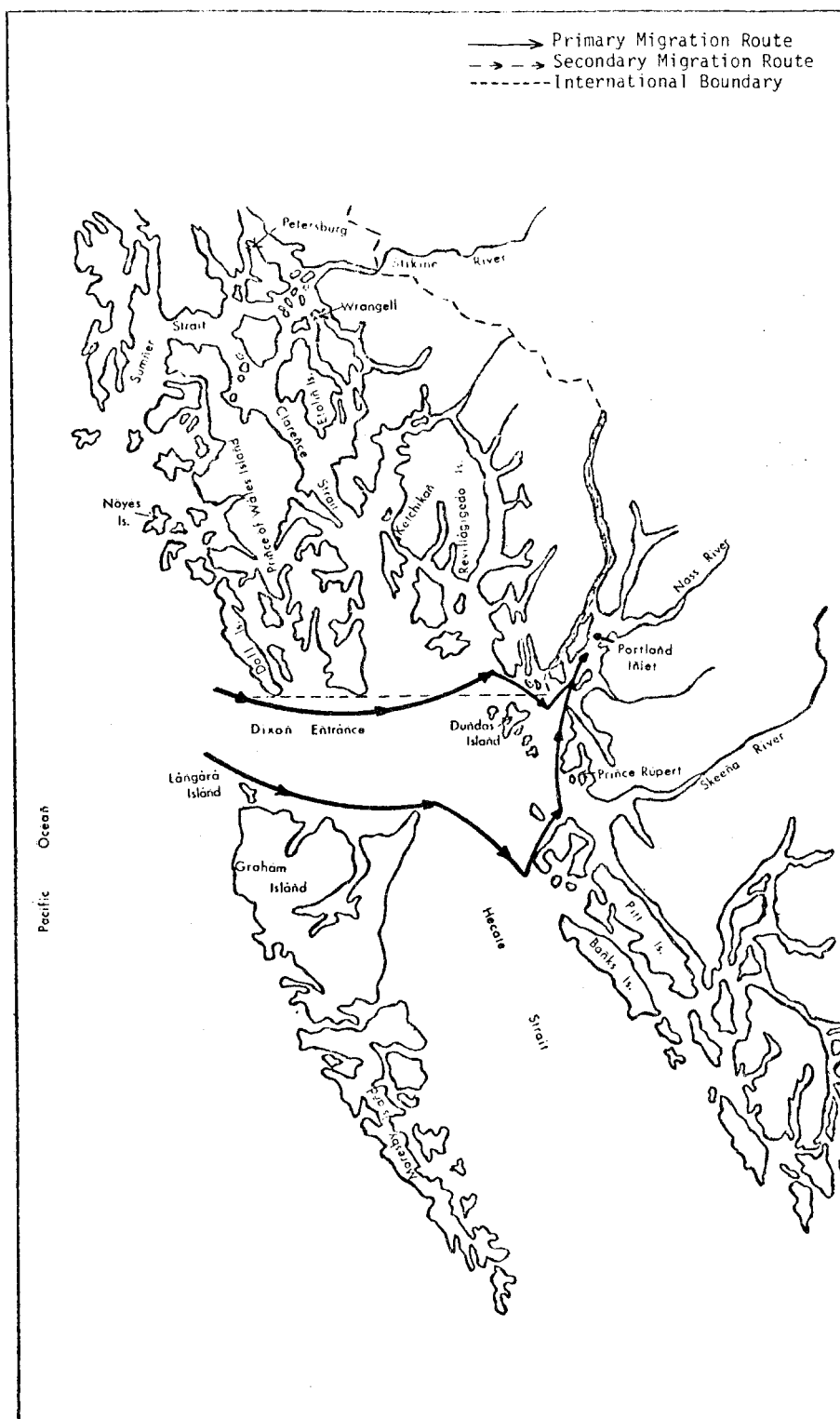


Figure 17. Portland Inlet pink salmon migration patterns as indicated by commercial and in-stream recoveries of pink salmon tagged in southern Southeastern Alaska and northern British Columbia, 1982.

consisted of 3 Noyes Island, 1 Langara Island, and 5 Area 1 releases (Appendix Table 10). Due to the limited number of recoveries in this system, it is impossible to state conclusively which migratory route was used by these stocks. Indications are that the Yukon River pink salmon stocks move inshore through Dixon Entrance, and then move up Masset Inlet, on Graham Island, and on into the Yakoun River (Figure 18).

Sockeye Salmon. No sockeye salmon tags were recovered from this system during 1982.

Area 6

Pink Salmon. A total of nine pink salmon tags were recovered from Area 6 in-stream surveys (Table 6). No recoveries were reported from this area's seine harvest of 564,548 pink salmon, or gill net harvest of 16,222 pink salmon (Table 4). The composition of these recoveries consisted entirely of Canadian releases, including 2 Langara Island, 3 Dundas Island, 1 Birnie/Maskelyne Island, 2 Area 5-1, and 1 Portland Inlet release (Appendix Table 8). Again, the limited number of recoveries from this area makes it impossible to state conclusively which migratory routes are used by this area's pink salmon stocks. Indications are that Area 6 pink salmon move inshore through Dixon Entrance, enter upper Hecate Strait and then move south into Area 6 systems in central Hecate Strait (Figure 18). Additional tagging in both upper and lower Hecate Strait in future years will be needed to confirm this pattern.

Sockeye Salmon. No sockeye salmon tags were recovered in this area during the 1982 field season.

Run Timing of Pink and Sockeye Salmon in Southern Southeastern Alaska and Northern British Columbia

Three major run timing periods were apparent from the tag release and recovery information. These were based on the time of passage past the various release sites in Alaskan and Canadian waters (Figures 1, 2, and 4). They should not be confused with time of appearance on the spawning grounds.

The migration periods ranged from early June through late September. The stock units identified for this analysis were early run (1-30 June), middle run (1-31 July), and late run (1 August to 30 September) according to similarities of passage in time.

Southern Southeastern Alaska:

Pink Salmon. Early run pink salmon consisted of those stocks which mostly passed the release sites in June. Early run pink salmon were found only in relatively small numbers from Noyes to Dall Islands, and in lower Clarence Strait. Pink salmon tagged near Noyes Island during this period were destined primarily for northern Southeastern Alaska (Districts 111-115), District 101 (including the Tree Point gill net fishery), and District 106 (including the Sumner and upper Clarence Strait gill net fisheries). Dall Island releases during this period were also destined primarily for District 101 and 106, while lower Clarence Strait releases returned almost exclusively to District 101 (Appendix Table 11).

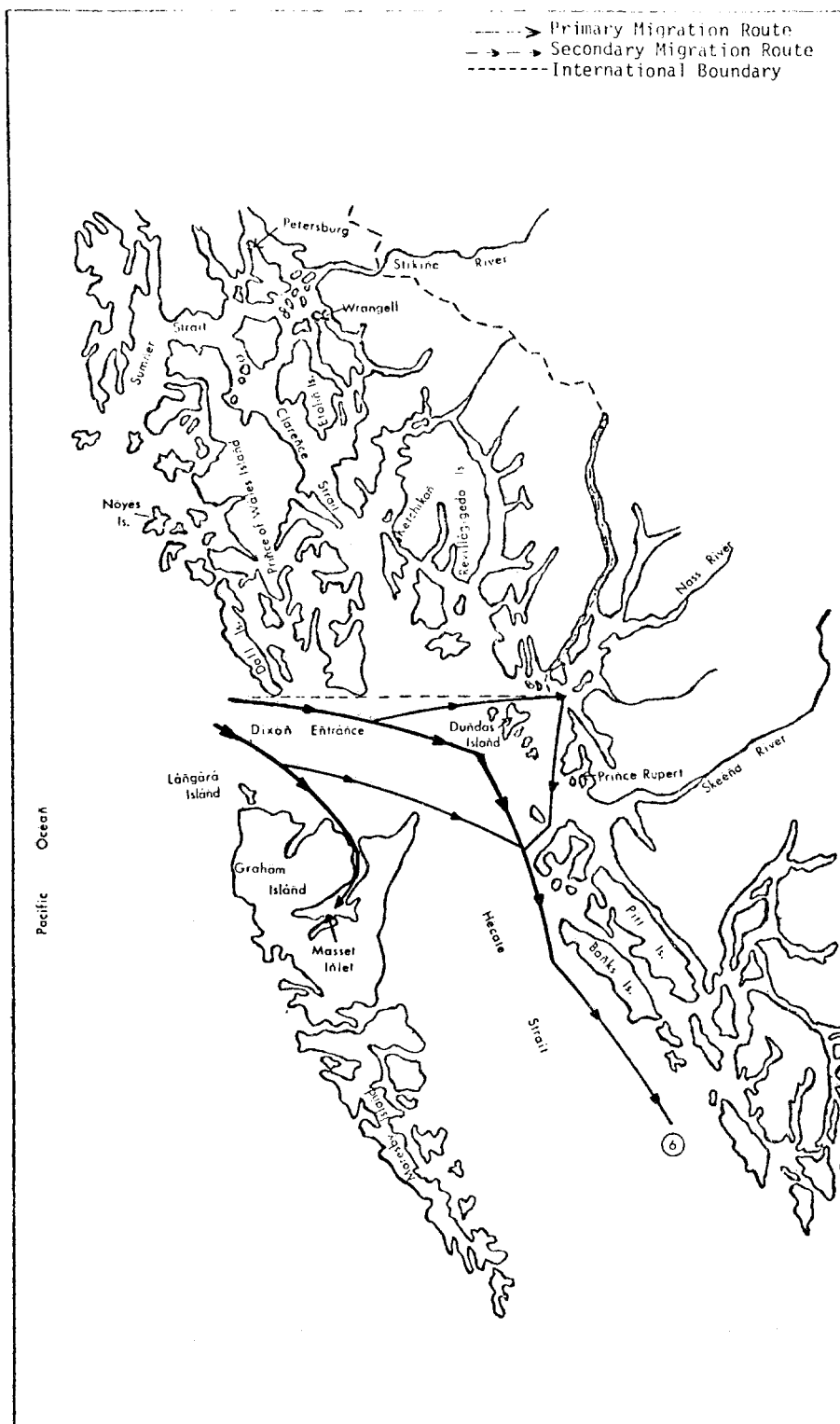


Figure 18. Masset Inlet and Area 6 pink salmon migration patterns as indicated by commercial and in-stream recoveries of tagged pink salmon released in southern Southeastern Alaska and northern British Columbia, 1982.

Middle run pink salmon were those stocks which passed the release sites mostly in July. The geographical distribution of the middle run stocks was widely dispersed. Pink salmon tagged and released during this period in the Noyes to Dall Island area were recovered primarily in Districts 101-104, with the majority reported from Districts 101 and 104. Only a small number of recoveries were reported from these release sites in the Skeena River, Area 1, and Area 3. Pink salmon tagged near Cape Fox were recovered in Districts 101, 102, and 107, the Skeena River, Area 1, and Area 3, while lower Clarence Strait releases were recovered in the same areas except for the Skeena River. The majority of recoveries from Cape Fox releases occurred in District 101, Area 1, and Area 3, while lower Clarence Strait releases were recovered primarily in District 101. On the other hand, upper and middle Clarence Strait releases were recovered in Districts 101-102, 106-107, and 110, with the majority of recoveries occurring in Districts 106 and 107 from upper Clarence Strait releases, and Districts 101 and 107 from middle Clarence Strait, Union Bay releases (Ernest Sound) were reported from District 101, 102, and 107, with District 107 recoveries representing the majority of these returns (Appendix Table 11).

The late run consisted of pink salmon stocks that passed the release sites in August and early September. Major concentrations of these stocks were noted at all of the release locations. Pink salmon tagged and released near Noyes and Dall Islands were recovered primarily in unspecified recovery areas, Districts 101-104, 106-107, the Skeena and the Nass Rivers, Area 1, and Area 3. The majority of these recoveries were reported from Districts 101-104. Cape Fox releases were recovered primarily in Districts 101-102, Area 1, and Area 3, while upper and middle Clarence Strait releases were recovered in Districts 101-102, 106-107, the Nass River, and Area 3. The majority of Cape Fox releases were recovered in District 101, while recoveries from middle and upper Clarence Strait releases were made primarily in Districts 101-102 and 106-107. Lower Clarence Strait releases were recovered in Districts 101-104, 106-107, the Skeena River, Area 1, and Area 3, with the majority of recoveries reported from Districts 101 and 102. In addition, the pink salmon released in Cordova Bay were recovered in Districts 101-104, 106-107, Skeena River, Area 1 and Area 3. The majority of these recoveries were reported from District 101-103. Union Bay recoveries were reported from Districts 101-102 and 106-107, with the majority returned from Districts 101 and 107 (Appendix Table 11).

Sockeye Salmon. Early run sockeye salmon consisted of populations which mostly passed the release sites in June. Early run sockeye were found in all areas except upper Clarence Strait, middle Clarence Strait, Cordova Bay, and Union Bay. Sockeye salmon tagged and released in the Noyes Island area were recovered in Districts 101-104, 106, 108, northern Southeastern Alaska (Districts 111-115), Yakutat, Prince William Sound, the Skeena and Nass Rivers, and Areas 1, 3 and 5, with the majority of the recoveries reported from Districts 101, 106, and the Skeena and Nass Rivers. Dall Island releases were recovered in the same areas as Noyes Island releases except District 106. The majority of the Dall Island recoveries were reported from District 101 and the Nass River. Sockeye salmon tagged and released near Cape Fox were recovered primarily in District 101, the Skeena and Nass Rivers, and Area 1, while lower Clarence Strait releases were reported from the same locations, and from District 102. Most recoveries from Cape Fox releases were reported in District 101, the Nass River, and Area 1, while tags recovered from lower Clarence Strait releases were reported primarily from Districts 101-102 and the Nass River (Appendix Table 11).

Middle run sockeye salmon passed the release sites mostly in July. Middle run sockeye salmon were found at all of the release sites during 1982 except for Cordova Bay. Sockeye salmon tagged and released near Noyes Island were recovered primarily from Districts 101-104, 106, the Skeena and Nass Rivers, and Areas 1, 3, 4, and 5, with most recoveries reported from District 101, the Skeena River, Area 3, and Area 5. Dall Island releases exhibited a similar recovery pattern except for a larger number of recoveries in District 102, a lack of recoveries in District 106, and additional recoveries reported from the Nass River. The majority of recoveries were reported from District 101, the Nass and Skeena Rivers, and Area 5. Cape Fox releases were recovered in District 101, the Skeena and Nass Rivers, Area 1, 3, 4, and 5, while lower Clarence Strait releases were recovered in Districts 101 and 102, the Skeena and Nass Rivers, Areas 1, 3, and 5. In both cases, most recoveries were reported from District 101, the Skeena and Nass Rivers, Areas 1, 3, and 5. Sockeye salmon released in upper Clarence Strait were recovered in Districts 101 and 102, 106 and 107, the Skeena and Nass Rivers, and Areas 1, 3, 4, and 5, with most recoveries reported in Districts 101-102, 106, the Skeena River, and Areas 3 and 5. Middle Clarence Strait releases were recovered in Districts 101 and 102, the Skeena River, Area 1, and Area 3. The majority of these recoveries were reported from Districts 101 and 102. Union Bay sockeye salmon releases were recovered in Districts 101 and 102, the Skeena River, and Areas 1, 3, and 4, with most recoveries reported from Districts 101 and 102 (Appendix Table 11).

The late run consisted of sockeye salmon stocks which migrated past the release sites in August and early September. Small concentrations of these stocks were noted at all of the release locations during 1982. Sockeye salmon tagged and released at Noyes Island during this period were recovered in Districts 101-104, the Skeena River, Area 1 and 3, with most recoveries reported from District 104 and the Skeena River. Dall Island releases were recovered in Districts 101 and 103, the Skeena and Nass Rivers, and Area 1, with the majority reported from District 101, the Skeena River, and Area 1. Sockeye salmon released near Cape Fox were recovered in District 101, the Nass River, and Areas 1 and 3, with most recoveries occurring in District 101 and the Nass River. Lower Clarence Strait releases were recovered primarily in District 101-102 and Areas 3, with the majority reported from District 101.

Upper Clarence Strait sockeye salmon releases were recovered in Districts 101 and 102, 106, the Skeena and Nass Rivers, and Areas 1, 3, and 5, with the majority of the returns reported from Districts 101 and 102 and the Skeena River. Middle Clarence Strait releases were limited and occurred in Districts 102-103 and Area 1, as were Cordova Bay releases, where the only recovery occurred in District 103. Recoveries of Union Bay releases were also limited and occurred only in District 102 (Appendix Table 11).

Northern British Columbia:

Pink Salmon. Early run pink salmon consisted of stocks which migrated past the release sites mostly in June. Early run pink salmon were found only near Langara and Dundas Islands in northern British Columbia. Pink salmon tagged and released near Langara Island were recovered in Districts 101-104, 106-107, northern South-eastern Alaska (Districts 111-115), the Skeena and Nass Rivers, Area 1, and Areas 3-6, with the majority reported from District 101, Area 1, and Area 3. Pink salmon releases off Dundas Island were recovered in Districts 101 and 102, 107, Area 1,

and Areas 3-5. Most recoveries were reported from District 101 and Area 3 (Appendix Table 11).

Middle run pink salmon were those stocks which migrated past the release sites in July. The distribution of middle run stocks was highly dispersed throughout the study area. Pink salmon tagged and released at Langara Island were recovered in Districts 101-104, 107, 110, northern Southeastern Alaska, (Districts 111-115), the Skeena and Nass Rivers, Area 1, and Areas 3-6. Most recoveries occurred in District 101, 104, the Skeena River, and Areas 1, 3, and 5. Pink salmon released near Dundas Island exhibited a similar distribution of recoveries except for the addition of recoveries from the Nass River. Most recoveries were reported from District 101, the Skeena River, Area 1, and Areas 3-5. Releases made at Tracy/Boston Rocks were recovered primarily in District 101, the Skeena River, Area 1, and Area 3, with the majority of returns reported in District 101, Area 1, and Area 3. Pink salmon released at Stephens/Porcher Island returned to District 101, the Skeena River, Area 1, and Areas 3-5, as did releases made near Birnie/Maskelyne Island. In both cases, the majority of recoveries were made in District 101, the Skeena River, Area 1, and Areas 3-5. Pink salmon released in Area 5-1 were recovered mainly in District 101, Area 1, and Area 3, while releases made in Area 1 were recovered in District 101-104, 106-107, 109-110, Area 1, and Area 3. The majority of recoveries for Area 5-1 releases occurred in District 101, and for Area 1, in Districts 101-102, 107, and Area 3. Portland Inlet pink salmon releases were recovered in District 101, the Skeena and Nass Rivers, Area 1, and Area 3, with most of the recoveries occurring in District 101, Area 1, and Area 3. Pink salmon tagged during the Skeena River secondary tagging program were recovered in District 101, the Skeena River, Area 4, and Area 5, with the majority of recoveries occurring within the Skeena River. Masset Inlet secondary tagged pink salmon were recovered in Districts 101 and 102, the Skeena River, Area 1, and Area 3. The majority of these recoveries occurred in District 101 and 102 and the Skeena River. Pink salmon releases during the Kwinamass Bay secondary tagging program were recovered in District 101, the Skeena River, Area 1, and Area 3, with the majority of the recoveries occurring in Area 1 and 3. Khutzymateen Inlet secondary tagged pink salmon recoveries were limited, but occurred in Areas 1 and 3 (Appendix Table 11).

The late run consisted of pink salmon stocks which passed the release sites in August and early September. Major concentrations of these stocks occurred at all areas except for Langara Island, Masset Inlet, and the Nass River. Pink salmon released near Langara Island during this period were recovered in Districts 101-103, Area 1, and Area 3, with most recoveries occurring in District 101. Dundas Island releases were recovered in Districts 101-104, 106-107, the Skeena and Nass Rivers, Area 1, and Areas 3-6. The majority of the recoveries occurred in District 101, Area 1, and Area 3. The distribution of Tracy/Boston Rocks recoveries were very similar to Dundas Island releases, with most tag recoveries occurring in District 101, Area 1, and Area 3. Stephens/Porcher Island pink salmon releases were recovered primarily in District 101, the Skeena and Nass Rivers, Area 1, and Areas 3-5. The majority of the recoveries occurred in District 101, the Skeena River, and Area 1. Birnie/Maskelyne Island releases were recovered in Districts 101-104, the Skeena and Nass Rivers, Area 1, and Areas 3-5, with the majority reported from District 101, Area 1, and Area 3. Pink salmon released in Area 5-1 were recovered in Districts 101-103, 106-107, the Skeena and Nass Rivers, Area 1, and Areas 3-5. The majority of the recoveries occurred in District 101, the Skeena and Nass Rivers, Area 1, and Area 3. Pink salmon released in Area 1 were

recovered in Districts 101-104, 106-110, northern Southeastern Alaska (Districts 111-115), the Skeena and Nass Rivers, Area 1, and Areas 3-5. Most recoveries occurred in Districts 101-103, 106-107, the Skeena River, Area 1 and Area 3. Portland Inlet pink salmon releases were recovered in Districts 101-103, 106-107, Area 1, and Area 3, with the majority of the recoveries occurring in Districts 101-102. Recoveries of Skeena River secondary tagged pink salmon were restricted mainly to the Skeena River, while Kwinamass Bay and Khutzymateen Inlet secondary tagged pinks were reported from District 101, Area 1, and Area 3, with most tags recovered in Area 1 and Area 3 for both release locations (Appendix Table 11).

Sockeye Salmon. Early run sockeye salmon consisted of stocks which migrated past the release locations in June. Early run sockeye salmon were tagged at Langara Island, Dundas Island, Tracy/Boston Rocks, Stephens/Porcher Islands, Birnie/Maskelyne Islands, and Portland Inlet in northern British Columbia. Sockeye salmon tagged and released at Langara Island during this time period were recovered in Districts 101-104, 106, the Skeena and Nass Rivers, Area 1, and Areas 3-5 with most tags reported from District 101, the Skeena and Nass Rivers and Area 1, Dundas Island releases were recovered in the same areas as Langara Island releases except for recoveries in Districts 103, 104, and 106, with most tags reported from District 101, the Skeena and Nass Rivers, and Area 1. Sockeye salmon released at Tracy/Boston Rocks were recovered in District 101, the Skeena and Nass Rivers, Area 1, and Area 3, while Stephens/Porcher Island releases were recovered in exactly the same areas, plus Area 5. The majority of recoveries for Tracy/Boston Rocks releases were reported from District 101, the Nass River, and Area 1, while Stephens/Porcher Island releases were recovered primarily in the Skeena River, Area 1, and Area 5. Birnie/Maskelyne Island sockeye salmon releases were recovered in Districts 101-102, the Skeena and Nass Rivers, Area 1, 3, and 5, with the majority of tags reported from the Nass River and Area 1. Early run sockeye salmon releases in Portland Inlet were recovered in District 101, the Nass River, and Areas 1, 3, and 4. Most recoveries were made in the Nass River and Area 1 (Appendix Table 11).

Middle run sockeye salmon stocks were those which passed the release sites in July. Middle run sockeye salmon stocks were found at all the release sites in northern British Columbia except for Masset Inlet, the Nass River, Kwinamass Bay, and Khutzymateen Inlet secondary tagging locations. Sockeye salmon tagged and released at Langara Island were recovered in Districts 101, 103-104, 106-107, northern Southeastern Alaska (Districts 111-115), the Skeena and Nass Rivers, Area 1, and Areas 3-5, with the majority reported from District 101, the Skeena and Nass Rivers, Area 3, and Area 5. Dundas Island releases were recovered in Districts 101-102, the Skeena and Nass Rivers, Area 1, and Areas 3-5. The majority of the recoveries were reported from District 101, the Skeena and Nass Rivers, and Areas 1, 3, and 5. Sockeye salmon released at Tracy/Boston Rocks and Stephens/Porcher Island were recovered in the same areas as Dundas Island releases. The majority of tagged fish released at Tracy/Boston Rocks were recovered in the Skeena and Nass Rivers, while Stephens/Porcher Island releases were recovered in the Skeena River and Area 5. Birnie/Maskelyne Island releases were recovered in District 101, 106, the Skeena and Nass Rivers, Area 1, and Areas 3-5, with most of the recoveries reported from District 101, the Skeena and Nass Rivers, and Area 1. Sockeye salmon released in Areas 1 and 5-1 were recovered primarily in the Skeena River, as were Skeena River secondary tagged sockeye. Portland Inlet sockeye releases were recovered in District 101, the Skeena and Nass Rivers, Area 1, and Areas 3-5, with the majority of the recoveries reported in the Skeena and Nass Rivers (Appendix Table 11).

The late run consisted of sockeye salmon stocks which passed the release sites in August and early September. Concentrations of these stocks were limited to Dundas Island, Tracy/Boston Rocks, Stephens/Porcher Island, Birnie/Maskelyne Island, and Area 5-1 in northern British Columbia. Sockeye salmon tagged and released near Dundas Island were recovered in District 101, the Skeena River, and Areas 1, 3, and 5, with the majority of the recoveries reported in the Skeena River. Tracy/Boston Rocks releases were recovered only in District 101 and the Nass River, on a very limited basis, while Stephens/Porcher Island releases were recovered in the Skeena and Nass Rivers, and Areas 1, 4, and 5, with the majority of the recoveries reported from the Skeena River. Sockeye salmon released near Birnie/Maskelyne Island and in Area 5-1 were recovered in District 101, the Skeena and Nass Rivers, and Areas 1, 3, and 4. The majority of Birnie/Maskelyne Island releases were recovered in District 101 and in the Skeena River, while Area 5-1 releases were recovered primarily in the Skeena River and Area 1 (Appendix Table 11).

Stock Intermingling of Pink and Sockeye Salmon in Southern Southeastern Alaska and Northern British Columbia

Pink Salmon:

The degree of pink salmon stock intermingling appeared to vary seasonably and between release sites. Most southern Southeastern Alaska and northern British Columbia pink salmon were noted to return to their natal streams within a six to twelve week period. Distinct differences in run timing were apparent for some stocks, however, overlap and similarities were noted for many others. A high degree of stock intermingling was evident along the Noyes to Dall Island, Cape Fox, and lower Clarence Strait shorelines during late July and August, while an even higher degree of intermingling was evident off Langara Island and Dundas Island in June. Additional intermingling of pink salmon stocks was also noted during July and August off Langara Island, Dundas Island, Tracy/Boston Rocks, Stephens/Porcher, and Birnie/Maskelyne Islands, as well as in Areas 1 and 5-1.

Sockeye Salmon:

The degree of sockeye salmon stock intermingling appeared to be much stronger early in the season than was detected for pink salmon. The majority of southern Southeastern Alaska and northern British Columbia sockeye salmon were found to return to their natal streams in a four to eight week period. Again, differences in run timing were apparent for some stocks, however, overlap and similarities were detected for many others. A high degree of stock intermingling was evident in June along the Noyes and Dall Island shoreline, near Cape Fox, in lower Clarence Strait, off Langara and Dundas Islands, near Tracy/Boston Rocks, Stephens/Porcher Island, Birnie/Maskelyne Island, and in Portland Inlet.

The degree of sockeye salmon stock intermingling continued to be high at all the southern Southeastern Alaska and northern British Columbia release sites during July, but began to drop off at some of the release sites in August. Increases in local stock concentrations along the Noyes Island to Dall Island shoreline, in Clarence Strait, off Stephens/Porcher Island and in Area 5-1 accounted for the reduction in stock intermingling at these locations. The degree of stock intermingling at all of the remaining release sites was relatively unchanged and continued at July levels.

The intermingling of pink and sockeye salmon stocks at most major release sites in 1982 demonstrated the difficulties of implementing stock management strategies for the harvest of either species due to the mixture of these fish noted at the majority of the study areas. This was complicated even further by the fact that both pink and sockeye salmon stocks from the two countries were observed to migrate past many of the release sites. Nevertheless, implementation of stock management, based on run timing, for the harvesting of pink salmon in certain areas early in the season would be less difficult.

A fairly homogeneous group of pink salmon was noted during June along the Noyes Island to Dall Island shorelines, and during the majority of the season in Cordova and Union Bays. Fishery openings in these areas could probably be adjusted accordingly to protect or direct harvest to the pink salmon stocks migrating through these areas during this time period. On the other hand, the potential for implementation of this type of management scheme for sockeye salmon is severely limited. Only a few areas would allow this type of a management scheme to be utilized. A fairly homogeneous group of sockeye salmon existed in Cordova Bay and within the Skeena River, which would have allowed fishery openings to be adjusted for the harvest of predominantly local stocks.

ESTIMATES OF NATIONAL CONTRIBUTION RATES FOR SELECTED FISHERIES

A primary objective of the 1982 joint U.S./Canada salmon tagging program was to provide more current estimates of national contributions to some major intercepting fisheries. Estimates used in past international discussions and negotiations were developed primarily from the major tagging programs of 1924-30, 1944-48, 1956-58, and 1966-68 discussed in the section under Previous Tagging Studies; information from smaller tagging programs also contributed to these estimates. These estimates, while perhaps representing the best available information at the time of their use, were generally recognized to be of questionable reliability due to design of the tagging programs. In a jointly prepared (circ. 1970) U.S./Canada technical report (Interception of Canada-Bound Salmon by Alaska Fishermen and of Alaska-Bound Salmon by Canadian Fishermen in the Southeastern Alaska - Northern British Columbia Region, 1967-70) the authors state "As a general rule, the taggings and tag recovery efforts have not been adequate in terms of tags applied, time, location, and effort to provide reliable data for interception estimates." Changing patterns in the conduct of fisheries and stock status have resulted in the need to obtain estimates of national contributions more representative of current conditions.

While the 1982 joint tagging study was designed to correct certain shortcomings in previous tagging programs, estimates of national contributions derived from the 1982 study still represent contributions under the set of circumstances, i.e., relative stock sizes and migration patterns, which occurred in 1982. Thus the appropriateness of applying 1982 season estimates to other years will depend on the degree of similarity of these factors.

Several design features of the 1982 tagging study distinguish it from previous studies. First, through extensive joint planning effort, tagging and tag recovery efforts were generally distributed throughout southern Southeastern Alaska and northern British Columbia where most pink and sockeye salmon stocks contributing to major intercepting fisheries for the greatest part pass through fisheries and

migrate to spawning grounds. Second, numbers of tagged fish released (approximately 156,000 pinks and 46,000 sockeye) were the largest for any adult salmon tagging study ever conducted in this area. Third, random sampling of catches and escapements provided a basis for estimating total numbers of tagged salmon recovered in fisheries and reaching the spawning grounds. In previous studies required assumptions of equal recoverability of tags in fisheries and streams of the two countries in the absence of random catch and escapement sampling were frequently questioned.

In the 1982 study tagged fish were released not only in intercepting fisheries of primary interest but also in other fisheries expected to recover *primary* tags. This provided a means of estimating the ultimate stock and national destination of tagged fish recovered in intervening fisheries while enroute to spawning grounds. In earlier studies, tags recovered in fisheries were either omitted from analysis with national contribution estimates being based on spawning ground recoveries, or included along with certain assumptions regarding their ultimate destination. Major tagging efforts were expended in areas of intercepting fisheries of greatest interest, such as Noyes Island, Dall Island/Cape Muzon and Tree Point/Cape Fox in Southeastern Alaska and Areas 1, 3X, 3Y, and 4 in British Columbia. Because of this and the generally greater availability of fish in these areas, larger numbers of tagged fish were released at these locations than some of the other areas (Tables 10 and 11). Estimates of national contribution rates derived for areas with smaller numbers of tag releases are expected to exhibit more variability than estimates for areas with larger tag releases.

Estimates of national contribution rates for selected fisheries were derived from the 1982 tagging studies through solution of a series of equations expressing stock contribution proportions as functions of estimated total recoveries in fisheries and estimated total recoveries in stock escapements. The unknowns in the equations were the proportional contributions of each defined stock to the various fisheries; solution of the equations yielded estimates of the stock proportions. For national contribution rate estimates, the individual stocks defined above were aggregated into two groups, U.S. and Canada. The underlying basis for the method is illustrated conceptually in Figure 19. Details of the mathematical formulation and solution of the equations are described in Appendix 12.

Pink Salmon

For the purpose of deriving national contribution estimates, *fisheries* and *stocks* were defined as shown in Table 8. Locations of *fisheries* or tag release sites are shown in Figure 1.

Estimates of total tags released in one fishery and recovered in another fishery were calculated from random catch sampling results by the formula:

$$(\text{proportion of tagged fish in catch samples}) \times (\text{catch})$$

with catch data being obtained from fish tickets completed at the time of sale.

Estimates of the total number of tagged fish from each release fishery which reached Southeastern Alaska spawning systems were calculated from the formula:

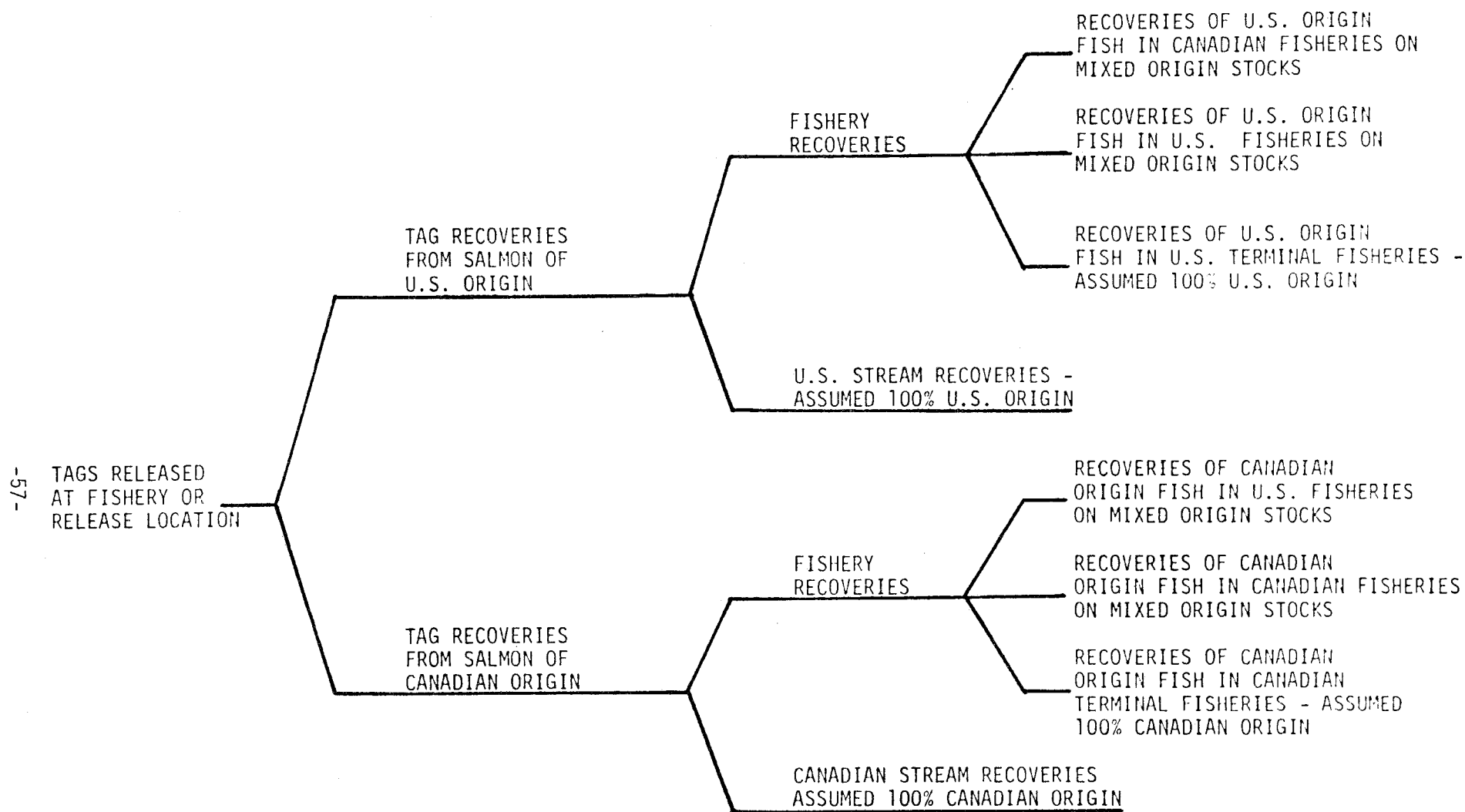


Figure 19. Generalized schematic diagram of estimation procedures for U.S. - Canada salmon interception rates based on adult salmon tagging data.

Table 8. Southern Southeastern Alaska and northern British Columbia *fisheries* and *stocks* defined for use in national contribution analysis in the joint 1982 adult salmon tagging studies.

I. FISHERIES (TAG RELEASE AREAS)

Southern Southeastern ¹ Alaska (District)		Northern British Columbia
Noyes Is.(4)		Area 1 Troll - Dixon Entrance
Dall Is./Cape Muzon(4)		Area 1 Seine - Langara Is.
Cordova Bay(3)		Area 3X - Dundas Is.
Upper Clarence Str.(6)		Area 3Y - Tracy/Boston Rocks, Birnie/Maskelyne Is.
Middle Clarence Str.(2)		Area 3Z - Portland Inlet
Lower Clarence Str.(1,2)		Area 4 - Stephens/Porcher Is.
Union Bay(7)		Area 5-1 - Hecate Str./Banks Is.
Tree Point/Cape Fox(1B)		

II. STOCKS

Southern Southeastern Alaska		Northern British Columbia	
Pink and Sockeye		Pink	Sockeye
District 1 Stocks		Skeena	Skeena
District 2 Stocks		Kwinamass	Nass
District 3 Stocks		Khutzymateen	
District 4-8 Stocks		Yakoun (Masset)	

¹ District numbers are given in parentheses.

$$\frac{(\text{proportion of tagged fish in escapement samples}) \times (\text{estimated total escapement})}{}$$

Because total pink salmon escapements are not obtained in Southeastern Alaska, it was necessary to develop estimates of total escapements for use in the above formula from the peak escapement counts obtained annually for management purposes. Peak escapement for a system is the maximum escapement observed in any single survey during the one or more aerial or foot surveys conducted during the season. As such, peak escapement counts do not fully take into account sequential spawning, i.e., entry of different groups or segments of the run throughout the season. Excluding the effect of counting accuracy by surveyors, peak escapement estimates represent a minimum estimate of the total spawning escapement. Methods used to develop lower, best, and upper estimates of total pink salmon escapements to southern Southeastern Alaska stocks from observed peak escapements in 1982 are described in Appendix 13. Resulting estimates for Districts 1-8 are shown in Table 9. These estimates should be considered preliminary as results from studies currently being conducted as part of the joint U.S./Canada research are expected to provide methods and data for more accurate estimation of total escapements.

Estimates of total escapements to southern Southeastern Alaska systems in 1982 range from a low of 5.6 million to a high of 8.9 million with a best or most likely estimate of 8.4 million. The low or most conservative estimate is the total peak escapement, the best estimate is 1.50 times the peak escapement and the high estimate is 1.58 times the peak escapement.

For Canadian stocks, estimates of total primary (i.e., fisheries) tags reaching spawning grounds were derived from secondary (i.e., stock) tagging conducted near or in systems where segregation of stocks was thought to have already occurred. Estimates of total primary tags reaching the spawning areas were calculated from random river escapement sampling by the formula:

$$\frac{(\text{No. of secondary tags released} / \text{No. of secondary tags observed}) \times (\text{No. of primary tags observed})}{}$$

or written in another form

$$\frac{(\text{No. of primary tags observed} / \text{No. of secondary tags observed}) \times (\text{No. of secondary tags released})}{}$$

Numbers of secondary tags released were adjusted for tags estimated to have been recovered in river fisheries.

The first formula above illustrates the use of secondary tags to estimate the detectability of tags during escapement sampling (primary and secondary tags being similar in appearance). The second form of the formula illustrates the direct dependence of estimates of numbers of primary tags reaching the spawning grounds on the number of secondary tags released, or more specifically, available for recovery.

Crucial to applicability of the method used for Canadian stocks are assumptions - or estimates - of secondary tag loss after initial release since estimates of

Table 9. Preliminary estimates of total 1982 sockeye and pink salmon escapements to southern Southeastern Alaska Districts 1-8 used for national stock contribution analysis. (No. of fish in thousands).

District(s)	Percent Area Distribution	Sockeye			Percent Area Distribution	Pink		
		Thousands of Fish				Thousands of Fish		
		Low	Mid-point	High		Low	Best	High
1	29.9	154	168	183	37.6	2,110	3,165	3,334
2	22.8	118	128	139	9.9	555	832	877
3	18.8	97	106	115	32.4	1,821	2,732	2,877
4-8	28.5	147	160	174	20.1	1,132	1,698	1,789
Totals	100.0	516	562	611	100.0	5,618	8,427	8,877

Notes: (1) Sockeye: Source J. Pella (manuscript in preparation and personal communications) calculated three estimates of 1982 total sockeye salmon escapements: 514,000, 519,000, and 611,000. The low estimate in the above table is the average of Pella's estimates of 514,000 and 519,000. The mid-point estimate is the average of 516,000 and Pella's high estimate of 611,000. The high estimate above is Pella's largest estimate of 611,000. The estimated percent area distribution was provided from an earlier analysis.

(2) Pink: (i) Source: Refer to Appendix 13.
(ii) Low estimate = peak escapement estimate; Best = 1.50 x peak; High = 1.58 x peak.

numbers of secondary tags actually available for recovery are required for use in the formulas. Three potential sources of secondary tag loss with respect to the target stock being tagged are (i) direct mortality, (ii) loss of tags due to loosening of the tags, flesh erosion and/or encounters with fishing gear such as gill nets and (iii) migration or straying to systems other than the target system.

Estimate of secondary tag loss rates are not currently available for Canadian stocks in 1982. However, results of secondary tagging of Alaska pink salmon stocks in 1982 (also described in this completion report) suggest that straying and migration of fish from the stream mouth at which they were tagged to other streams was extensive enough to prohibit use of secondary tagging for estimation of total escapements to the study streams. Furthermore, secondary sockeye salmon tagging conducted in 1983 off stream mouths of a number of Southeastern Alaska streams with counting weirs indicated an average tag loss rate of about 40 percent. (J. Pella, personal communication.) Secondary tagging in the larger Canadian rivers may have had lower tag loss rates due to straying and/or migration to other systems.

In the absence of specific estimates of secondary tag loss rates for Canadian stocks, national contribution analysis was conducted for assumed rates of 0, 20, and 40 percent. The three tag loss rates were used with each of the three estimates of southern Southeastern Alaska pink salmon total escapements derived above. This provides some indication of the potential effect of variation or errors in estimates of escapements and/or secondary tag loss rates on subsequent estimates of national contributions are shown in Tables 10 A and B. IT SHOULD BE EMPHASIZED THAT THESE ESTIMATES APPLY ONLY TO AREAS AND TIMES OF TAG RELEASES (Appendix Table 5).

For present discussion of results, we limit attention to national contribution estimates derived using the *best* (i.e., considered the most likely) estimate (1.50 x peak escapement) of total pink salmon escapement to southern Southeastern Alaska. Since there is no basis at this time for selecting a most likely estimate of secondary tag loss rate for Canadian stocks, the range of national contribution estimates resulting from assumed secondary tag loss rates of 0 to 40% will be used for discussion.

As seen in Table 10 A, estimates of Canadian stock contributions to Alaska pink salmon 'fisheries' (i.e., to mixed stocks in the tag release areas) range from a low of zero in middle and lower Clarence Strait to a high of 12-18% at the Tree Point/Cape Fox fishery. Estimated Canadian contributions in District 4 at the Noyes Island and Dall Island/Cape Muzon areas were nearly identical at 7-11% and 8-12%, respectively. In the Cordova Bay area of District 3, the Canadian contribution was estimated to be 2-3%, somewhat less than estimated for the more outside fisheries of District 4. In the inside Districts 1 and 2, estimates of Canadian contributions ranged from zero in lower and middle Clarence Strait to 7-9% in the Union Bay area. The highest estimates of Canadian stock contributions were for the Tree Point/Cape Fox boundary area with 12-18% of the pinks estimated to be bound for Canadian systems.

As seen in Table 10 B, estimates of Alaskan stock contributions to Canadian 'fisheries' (i.e., to mixed stocks in the tag release areas) range from 6-10% in Area 5-1 to 59-71% in the Area 1 seine and troll fisheries. Estimates of Alaskan stock contributions to the three Area 3 fisheries were very similar with 28-39%

Table 10 A. Preliminary estimates of percent national contributions to selected pink salmon fisheries in southern Southeastern Alaska and northern British Columbia based on joint 1982 adult salmon tagging studies.

(NOTE: CONTRIBUTION RATE ESTIMATES APPLY TO AREAS AND TIMES OF TAG RELEASES.)

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I. SOUTHEAST ALASKA FISHERIES		Noyes	Dall/ Muzon	Cordova Bay	----- Upper	Clarence Straits Middle	----- Lower	Union Bay	Tree Point/ Cape Fox	
No. of Tags Released		17,200	5,757	5,606	6,942	14,666	12,950	1,240	17,477	
Est. Southern S.E. Alaska Escapements	Assumed Secondary Tag Loss (%) for Canadian Stocks	Alaska Stock Percent / Canada Stock Percent								
Low (=Peak) =5,618,000	0	84/16	82/18	96/4	94/6	100/0	100/0	88/12	75/25	
	20	87/13	85/15	97/3	96/4	100/0	100/0	90/10	79/21	
	40	90/10	88/12	97/3	97/3	100/0	100/0	92/8	84/16	
	Best (=1.50 x Peak) =8,427,000	0	89/11	88/12	97/3	96/4	100/0	100/0	91/9	82/18
		20	91/9	90/10	98/2	97/3	100/0	100/0	93/7	85/15
		40	93/7	92/8	98/2	98/2	100/0	100/0	95/5	88/12
	High (=1.58 x Peak) =8,877,000	0	89/11	88/12	97/3	96/4	100/0	100/0	92/8	83/17
		20	91/9	90/10	98/2	97/3	100/0	100/0	93/7	86/14
		40	93/7	92/8	98/2	98/2	100/0	100/0	95/5	89/11
U.S./Canada Tenth Technical Interception Report for 1978 (Even Year Estimates)										
U.S. Estimates	92/8	1	99/1	2	2	99/1	2	95/5		
Canada Estimates	91/9	1	99/1	2	2	99/1	2	95/5		

¹ Single estimate for District 4 fisheries.

² Assumed to be 100% Alaskan stocks.

Table 10 B. Preliminary estimates of percent national contributions to selected pink salmon fisheries in southern Southeastern Alaska and northern British Columbia based on joint 1982 adult salmon tagging studies.

(NOTE: CONTRIBUTION RATE ESTIMATES APPLY TO AREAS AND TIMES OF TAG RELEASES.)

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II. BRITISH COLUMBIA FISHERIES		Area 1 Troll	Area 1 Seine	Area 3X	Area 3Y	Area 3Z	Area 4	Area 5-1
No. of Tags Released		12,487	3,465	12,749	17,624	4,924	7,128	9,473
Est. Southern S.F. Alaska Escapements	Assumed Secondary Tag Loss (%) for Canadian Stocks	Canada Stock Percent / Alaska Stock Percent						
Low (=Peak) =5,618,000	0	51/49	51/49	80/20	79/21	80/20	94/6	96/4
	20	45/55	45/55	76/24	75/25	76/24	93/7	95/5
	40	38/62	39/61	70/30	70/30	70/30	91/9	93/7
Best (=1.50 x Peak) =8,427,000	0	41/59	41/59	72/28	72/28	72/28	92/8	94/6
	20	36/64	36/64	68/32	67/33	68/32	90/10	93/7
	40	29/71	30/70	61/39	60/40	61/39	87/13	90/10
High (=1.58 x Peak) =8,877,000	0	40/60	39/61	72/28	71/29	71/29	91/9	94/6
	20	34/66	34/66	67/33	66/34	67/33	89/11	92/8
	40	28/72	28/72	60/46	59/41	60/40	86/14	90/10
U.S./Canada Tenth Technical Interception Report for 1978 (Even Year Estimates)							Area 5-1	Area 5 Other
U.S. Estimates		68/32	84/16	64/36	80/20	94/6	91/8	60/40 99/1
Canada Estimates		68/32	84/16	46/54	73/27	94/6	92/9	57/43 99/1

in Area 3X, 28-40% in Area 3Y and 28-40% in Area 3Z. Approximately 8-13% of the fish in Area 4 were estimated to be bound for southern Southeastern Alaska systems.

For comparison, estimates of national contribution rates used in the U.S./Canada Tenth Technical Interception Report are also shown in Tables 10 A and B. A series of ten Technical Interception Reports were prepared jointly by the U.S. and Canada during 1967-78 to present what were believed to be the best available estimates of annual interception numbers for use in the ongoing international discussions and negotiations. Nearly all of the interception rate estimates in these reports were based on analysis of data from the earlier tagging studies discussed in the section under Previous Tagging Studies. Interception rate estimates used in the Tenth Technical Report for 1978 were also used in the reports for 1971-77. (Separate estimates were used for even numbered and odd numbered year pink salmon.

As can be seen in Table 10 A for Alaskan fisheries, estimates of Canadian pink salmon stock contributions from the 1982 study and the Technical Report were very similar, varying by only a few percentage points except in one area. In the Tree Point/Cape Fox area the 1982 study yielded estimates of from 12 to 18% compared to 5% in the Technical Report.

For Canadian fisheries in Table 10 B, estimates of Alaskan pink salmon stock contributions were quite different in the 1982 study and the Technical Report. In all areas except Area 3X, estimates of Alaskan contribution rates were similar or higher in the 1982 study than in the Technical Report. One of the largest differences occurred in the Area 1 seine fishery where the 1982 study yielded estimates of 59 to 70% compared to the Technical Report estimate of 16%. A large difference also occurred in Area 3Z with an estimate of 28 to 39% from the 1982 study compared with 6% in the Technical Report. In Area 3X the 1982 study estimate of 28 to 39% was similar to the U.S. estimate of 36% in the Technical Report but substantially less than the Canadian estimate of 54% in the same report.

A number of factors could contribute to the above differences. First, national stock proportions occurring in any year in a given area are a function of relative stock sizes and specific migration patterns. Thus, even in the absence of statistical estimation errors, national contribution rates are expected to reflect some between-year differences. Second, some of the earlier tagging studies were designed to provide general migration pattern information; stock contribution rate estimates derived from such studies could contain substantial error. Third, differences in locations and timing of tag releases would be expected to contribute to some differences in the estimates. Fourth, sampling variation alone accounts for some estimation error. In terms of general program design, numbers of tags released, and tag recovery methods, the 1982 study would be expected to provide more reliable estimates - given the particular combination of stock sizes and migration patterns occurring in 1982.

Sockeye Salmon

For the purpose of estimating national contribution rates for sockeye salmon stocks, the basic procedures described in the previous section on pink salmon were also used.

Total sockeye escapements to the 59 significant sockeye systems in southern Southeastern Alaska are not directly estimated; however estimates of total 1982 escapements were derived from analysis of weir counts, peak escapement counts, and secondary or stock tagging available for a number of systems. (J. Pella, manuscript in preparation.) Using different techniques, three estimates were obtained: 514,000, 519,000, and 611,000. For national contribution rate analysis, the two smaller estimates were averaged to produce a low estimate of 516,000. The largest of the three estimates, 611,000 which was based in part on secondary tagging, was used as a high estimate while the average of the low and high estimates, 562,000, was used as a mid-point estimate. For the purpose of analysis, the estimated total southern Southeastern Alaska escapements were also allocated to Districts 1, 2, 3, and 4-8 based on area distribution percentages developed during an earlier analysis of the 1982 escapement studies. (J. Pella, personal communication.) These estimates of total southern Southeastern Alaska sockeye escapements are summarized in Table 9.

Because specific estimates of secondary tag loss rates were not available for Canadian sockeye salmon stocks, national contribution analysis was conducted at assumed rates of 0%, 20%, and 40% as for pink salmon. Since secondary or stock tagging was not conducted on Canadian sockeye salmon stocks bound for the Kwinamass, Khutzymateen or Yakoun (Masset Inlet) systems, only the two major sockeye stocks, the Skeena and Nass, were included in the analysis. However, these two systems are thought to be the primary Canadian contributors to Southeastern Alaska fisheries.

The three secondary tag loss rates were used with each of the three estimates of total escapement. Again, this procedure was followed to provide some indication of the effect of variation or errors in estimates of escapements and secondary tag loss rates on estimates of national contribution rates. Resulting estimates of national contribution rates for the various fisheries are summarized in Tables 11 A and B. IT SHOULD BE EMPHASIZED AGAIN THAT THESE ESTIMATES APPLY ONLY TO AREAS AND TIMES OF TAG RELEASES (Appendix Table 5).

For present discussion purposes, national contribution rate estimates were derived using the mid-point estimate of 562,000 fish for southern Southeastern Alaska 1982 total sockeye salmon escapement and a range of 0% to 40% secondary tag loss rates for Canadian stocks will be used.

As shown in Table 11 A, estimates of Canadian contribution rates to the selected southern Southeastern Alaska sockeye salmon fisheries range from a low of 8% to 12% in Cordova Bay (District 3) to a high of 64% to 74% at Noyes Island (District 4). In District 4 the estimated Canadian contribution rate of 64% to 74% at Noyes Island was somewhat higher than at the more southerly portion of the district near Dall Island/Cape Muzon where the estimate was 50% to 62%. The estimated rate of 8% to 12% for Cordova Bay in District 3, located immediately inside of District 4, was much less than at either of the District 4 locations. In Clarence Strait Canadian contribution rates ranged from a high of 51% to 63% in the upper area to 11% to 17% in the lower area. The decreasing trend of Canadian contribution rates from upper to lower Clarence Strait may be due to several factors. First, as suggested by the migration pattern analysis and cursory examination of individual stock contribution rates, immigration of Southeastern Alaska District 1 and 2 stocks through Dixon Entrance into the lower Straits could result in dilution

Table 11 A. Preliminary estimates of percent national contributions to selected sockeye salmon fisheries in southern Southeastern Alaska and northern British Columbia based on joint 1982 adult salmon tagging studies.

(NOTE: CONTRIBUTION RATE ESTIMATES APPLY TO AREAS AND TIMES OF TAG RELEASES.)

I. SOUTHEAST ALASKA FISHERIES		Noyes	Dall/ Muzon	Cordova Bay	----- Upper	Clarence Straits Middle	----- Lower	Union Bay	Tree Point/ Cape Fox	
No. of Tags Released		2,813	1,433	29	2,173	136	382	108	1,636	
Est. Southern S.E. Alaska Escapements		Assumed Secondary Tag Loss (Percent) for Canadian Stocks		Alaska Stock Percent / Canada Stock Percent						
-66-	Low (= 516,000)	0	24/76	36/64	87/13	35/65	69/31	82/18	40/60	45/55
		20	28/72	41/59	89/11	40/60	74/26	85/15	46/54	51/49
		40	34/66	48/52	91/9	46/54	78/22	88/12	53/47	58/42
	Mid-point (= 562,000)	0	26/74	38/62	88/12	37/63	71/29	83/17	43/57	48/52
		20	30/70	44/56	90/10	42/58	75/25	86/14	48/52	53/47
		40	36/64	50/50	92/8	49/51	80/20	89/11	55/45	60/40
	High (= 611,000)	0	27/73	40/60	89/11	39/61	73/27	84/16	45/55	50/50
		20	32/68	46/54	91/9	44/56	77/23	87/13	50/50	55/44
		40	38/62	52/48	93/7	51/49	81/19	90/10	58/42	62/38
U.S./Canada Tenth Technical Interception Report for 1978										
U.S. Estimates		46/54	1	2	94/6	97/3	98/2	2	81/19	
Canada Estimates		40/60	1	2	90/10	90/10	90/10	2	25/75	

¹ Single estimate for District 4 fisheries.

² Assumed to be 100% Alaskan stocks.

of Canadian stocks migrating southward to the Skeena and Nass Rivers. Second, tagging in the upper portion of Clarence Strait occurred in narrower portions of the Straits where migrating salmon were perhaps more concentrated and available for capture. Tagging in the wider middle and lower portions of the Straits occurred more along shorelines where Southeastern Alaska stocks migrating to nearby spawning areas were perhaps more concentrated; Canadian stocks migrating to the more distant Nass and Skeena Rivers may have tended to migrate in a more scattered fashion across the width of the Straits. The estimated Canadian contribution rate for the Tree Point/Cape Fox area was from 40% to 52%.

In the Canadian fisheries (Table 11 B) estimated contribution rates of Southeastern Alaska stocks range from a low of zero in Area 5-1 to 12% to 18% in the Area 1 seine district off Langara Island. The estimated Alaska contribution rate of zero in the Area 1 troll fishery in Dixon Entrance is probably not reliable because of the small number (47) of tagged sockeye salmon released. In Area 3, Alaska contribution rate estimates were 0% to 1% in Sub-area 3X, 2% to 4% in 3Y, and 3% to 5% in 3Z. The Area 4 estimate was 5% to 9%.

For comparison with the 1982 study result, estimates of sockeye salmon stock contribution rates used in the previously referenced U.S./Canada Tenth Technical Interception Report are also shown in Tables 11 A and B. As seen in Table 11 A, considerable differences exist in estimated Canadian stock contribution rates to southern Southeastern Alaska fisheries. The 1982 study produced higher estimates of Canadian contribution rates for each of the Southeastern Alaska fisheries. Estimates from the two sources were most similar for the Noyes Island area where the 1982 study yielded an estimate of 64% to 74% compared to the Technical Report estimate of 54% to 60%. The largest difference occurred in upper Clarence Strait where the 1982 study estimate was 51% to 63% versus 6% to 10% in the Technical Report. For the Tree Point/Cape Fox area where the Technical Report U.S. estimate was 19% and the Canadian estimate 75%, the 1982 study estimate was 40% to 52% or very similar to the average (47%) of the two Technical Report estimates. (The Canadian estimate of 75% in the Technical Report was based on examination of age composition differences for Southeastern Alaska and British Columbia stocks rather than past tagging studies.)

For Canadian fisheries (Table 11 B), Alaska stock contribution rates estimated from the 1982 study were generally similar to the Technical Report estimates. The largest difference occurred for the Canadian Area 1 seine district off Langara Island where 1982 tagging indicated an Alaskan contribution rate of 12% to 18% compared to 2% in the Technical Report.

Possible explanations for these differences are the same as discussed above for the pink salmon estimates, namely between-year differences in national stock sizes and migration patterns, and inadequacies in designs of earlier tagging studies for making contribution rate estimates, differences in tagging areas and times for the different studies and sampling variations. Other stock separation techniques such as scale pattern analysis, electrophoretic analysis, and parasite analysis were also investigated during the joint 1982 research program and may eventually provide some independent estimates of national stock contribution rates for sockeye during the 1982 season.

Table 11 B. Preliminary estimates of percent national contributions to selected sockeye salmon fisheries in southern Southeastern Alaska and northern British Columbia based on joint 1982 adult salmon tagging studies.

(NOTE: CONTRIBUTION RATE ESTIMATES APPLY TO AREAS AND TIMES OF TAG RELEASES.)

II. BRITISH COLUMBIA FISHERIES		Area 1 Troll	Area 1 Seine	Area 3X	Area 3Y	Area 3Z	Area 4	Area 5-1
No. of Tags Released		47	7,909	10,090	5,920	1,348	5,637	490
Est. Southern S.E. Alaska Escapements	Assumed Secondary Tag Loss (Percent) for Canadian Stocks	Canada Stock Percent / Alaska Stock Percent						
Low (= 516,000)	0	100/0	89/11	100/0	98/2	97/3	95/5	100/0
	20	100/0	87/13	100/0	97/3	97/3	94/6	100/0
	40	100/0	84/16	99/1	96/4	96/4	92/8	100/0
Mid-Point (= 562,000)	0	100/0	88/12	100/0	98/2	97/3	95/5	100/0
	20	100/0	86/14	100/0	97/3	96/4	93/7	100/0
	40	100/0	82/18	99/1	96/4	95/5	91/9	100/0
High (= 611,000)	0	100/0	88/12	100/0	98/2	97/3	94/6	100/0
	20	100/0	85/15	99/1	97/3	96/4	93/7	100/0
	40	100/0	81/19	99/1	96/4	95/5	91/9	100/0
U.S./Canada Tenth Technical Interception Report for 1978								
U.S. Estimates		98/2	98/2	94/6	97/3	1	1	1
Canada Estimates		98/2	98/2	93/7	97/3	1	1	1

¹ Assumed 100% Canadian stocks.

DISCUSSION

Direct application of the migration pattern, run timing, and stock intermingling information derived from the 1982 U.S./Canada research program by management personnel should be done with caution. The information gained is based on one year's research and to adopt a blanket application of this information would not be justified because of yearly variations in year class strength. Only after a complete sockeye salmon cycle (four years) and two replications of pink salmon odd-even year cycles (four years) should complete application of this data be undertaken.

The following observations derived from the 1982 U.S./Canada salmon interception research on pink and sockeye salmon are suggested as having important fishery management applications.

1. The majority of District 101 pink salmon returned via Dixon Entrance. A portion of these stocks moved into upper Hecate Strait, while others moved as far north in Clarence Strait as the confluence of Ernest Sound before returning to their natal streams.
2. A few District 101 pink salmon returned to their natal streams via Sumner and Clarence Straits.
3. District 101 sockeye salmon returned to their natal streams via the same routes exhibited by this district's pink salmon.
4. Most District 102 pink salmon returned to their natal streams via Dixon Entrance. Portions of these stocks moved inshore as far south as upper Hecate Strait and as far north in Clarence Strait as the confluence of Ernest Sound before returning to their natal streams.
5. About half of the District 102 sockeye salmon returned to their natal streams via Sumner and Clarence Strait, while the remaining portion returned via Dixon Entrance and lower Clarence Strait.
6. Most District 103 pink salmon returned via Cordova Bay or the many west coast island passages.
7. Some District 103 pink salmon migrated into lower Clarence Strait and upper Hecate Strait via Dixon Entrance before returning to their natal streams.
8. Most District 103 sockeye salmon returned via Cordova Bay or the many west coast island passages.
9. A few of the District 103 sockeye salmon migrated into lower Clarence Strait and upper Hecate Strait via Dixon Entrance before returning to their natal streams.
10. Most District 104 pink and sockeye salmon returned via the many west coast island passages.
11. A few District 104 pink and sockeye salmon moved into lower Clarence Strait and upper Hecate Strait before returning to their natal streams.

12. Most District 105 pink salmon returned via lower Sumner Strait.
13. Most District 106 pink and sockeye salmon returned via Sumner and upper Clarence Straits.
14. A few District 106 pink and sockeye salmon returned via Dixon Entrance, moved into upper Hecate Strait or migrated up Clarence Strait before returning to their natal streams.
15. Most District 107 pink and sockeye salmon returned via Sumner and upper Clarence Straits.
16. A few District 107 pink and sockeye salmon returned via Dixon Entrance and lower Clarence Strait.
17. Most District 108 pink salmon returned via Sumner or Stikine Straits.
18. A few District 108 pink salmon stocks returned via Dixon Entrance and Clarence Strait.
19. Most lower District 109 pink salmon stocks returned via lower Chatham Strait, Rocky Pass, Wrangell Narrows, and Dry Strait.
20. The rest of the lower District 109 pink salmon stocks returned via Dixon Entrance, Clarence Strait, Wrangell Narrows, and Dry Strait.
21. Most lower District 110 pink salmon stocks returned via the same migration routes identified for lower District 109 pink salmon.
22. Most pink salmon returning to the Skeena River returned via lower Hecate Strait.
23. The rest of the pink salmon returning to the Skeena River entered via Dixon Entrance and upper Hecate Strait or Sumner, Clarence, and upper Hecate Straits.
24. Most sockeye salmon returning to the Skeena River entered via Dixon Entrance and upper Hecate Strait.
25. The rest of the sockeye salmon returning to the Skeena River moved inshore via Sumner, Clarence, and upper Hecate Strait or lower Hecate Strait.
26. Most pink salmon returning to the Nass River moved inshore via Sumner, Clarence, and upper Hecate Straits.
27. The rest of the pink salmon returning to the Nass River entered via Dixon Entrance and upper Hecate Strait.
28. Most of the sockeye salmon returning to the Nass River moved inshore via Dixon Entrance, lower Revillagigedo Channel, and upper Hecate Strait.

29. The rest of the sockeye salmon returning to the Nass River moved inshore via Sumner, Clarence, and upper Hecate Straits.
30. Pink salmon destined for Portland Inlet returned via Dixon Entrance, lower Revillagigedo Channel, and upper Hecate Strait.
31. Pink salmon destined for the Yakoun River moved inshore via Dixon Entrance and Masset Inlet before migrating into this river.
32. Pink salmon returning to Area 6 in Central Hecate Strait migrated inshore via Dixon Entrance and upper Hecate Strait.
33. Fishery openings in June along the Noyes to Dall Island shorelines would have targeted on northern Southeastern Alaska, District 101, and District 106 pink salmon stocks in 1982.
34. Fishery openings in June in lower Clarence Strait would have targeted on District 101 pink salmon stocks in 1982.
35. Fishery openings in July in the Noyes to Dall Island area would have concentrated on District 101 and 104 pink salmon in 1982.
36. Fishery openings in July near Cape Fox and in lower Clarence Strait would have targeted on District 101, Area 1, and Area 3 pink salmon stocks in 1982.
37. Fishery openings in July in Union Bay and upper or middle Clarence Strait would have targeted on District 101, 106, and 107 pink salmon stocks in 1982.
38. Fishery openings in August along the Noyes to Dall Island shorelines would have targeted on District 101-104 pink salmon stocks in 1982.
39. Fishery openings in August near Cape Fox and in lower Clarence Strait would have targeted on District 101 and 102 pink salmon stocks in 1982.
40. Fishery openings in August in upper and middle Clarence Strait would have targeted on District 101-102 and 106-107 pink salmon stocks in 1982.
41. Fishery openings in July and August at Noyes Island, Dall Island, and Clarence Strait would have harvested small numbers of Canadian pink salmon stocks (Nass River, Skeena River, Area 1, and Area 3) in 1982.
42. Fishery openings along the Noyes to Dall Island shoreline in June would have targeted on District 101, 106, and Skeena and Nass River sockeye salmon stocks in 1982.
43. Fishery openings near Cape Fox and in lower Clarence Strait in June would have targeted primarily on District 101, 102, Nass River, and Area 1 sockeye salmon stocks in 1982.

44. Fishery openings in July along the Noyes to Dall Island shorelines would have targeted on District 101, Skeena and Nass River, Area 3, and Area 5 sockeye salmon stocks in 1982.
45. Fishery openings near Cape Fox and in lower Clarence Strait during July would have targeted on District 101, Skeena and Nass River, and Area 1, 3, and 5 sockeye salmon stocks in 1982.
46. Fishery openings in Union Bay, upper, or middle Clarence Strait in July would have targeted on Districts 101, 102, 106, Skeena River, and Area 3-5 sockeye salmon stocks in 1982.
47. Fishery openings in August along the Noyes to Dall Island shorelines would have targeted on District 104 and Skeena River sockeye salmon stocks in 1982.
48. Fishery openings in August near Cape Fox and in lower Clarence Strait would have targeted on District 101 and Nass River sockeye salmon stocks in 1982.
49. Fishery openings during August in Union Bay, or upper or middle Clarence Strait would have targeted on Districts 101, 102, and Skeena River sockeye salmon stocks in 1982.
50. The most heterogeneous mixture of pink and sockeye salmon stocks was noted off Noyes and Dall Islands, and the Cape Fox and Clarence Strait shorelines. This suggests that derivation of sound stock management strategies based on run timing for harvesting these fish at these locations would be difficult.
51. The most homogeneous mixture of pink and sockeye salmon stocks was noted in Cordova Bay and to a lesser extent in Union Bay. This suggests that derivation of sound stock management strategies based on run timing for harvesting pink or sockeye salmon in these areas is possible.
52. Fishery openings in June near Langara and Dundas Islands would have targeted on District 101, Area 1, and Area 3 pink salmon stocks in 1982.
53. Fishery openings near Langara and Dall Islands during July would have targeted on pink salmon stocks from District 101, 104, and the Skeena and Nass Rivers, Area 1, 3, and 5 in 1982.
54. Fishery openings in July near Tracy/Boston Rocks would have targeted on District 101, Area 1, and Area 3 pink salmon stocks in 1982.
55. Fishery openings in July near Stephens/Porcher Islands or Birnie/Maskelyne Islands would have targeted on pink salmon stocks from District 101, Skeena River, Area 1, and Areas 3 to 5 in 1982.
56. Fishery openings in Area 1 and Area 5-1 in July would have targeted on Districts 101, 102, and Area 3 in 1982.

57. Fishery openings in Portland Inlet in July would have targeted on District 101, Area 1, and Area 3 pink salmon stocks in 1982.
58. Fishery openings in July on the lower Skeena River would have targeted on Skeena River pink salmon, while openings in Masset Inlet would have targeted on Districts 101, 102, and Skeena River pink salmon stocks in 1982.
59. Fishery openings in Kwinamass Bay or Khutzymateen Inlet in July would have targeted on Area 1 and Area 3 pink salmon stocks in 1982.
60. Fishery openings near Langara Island in August or early September would have targeted primarily on District 101 pink salmon stocks in 1982.
61. Fishery openings in August and early September near Stephens/Porcher Islands and Birnie/Maskelyne Islands, Dundas Island, and Tracy/Boston Rocks would have targeted on District 101, Area 1, and Area 3 pink salmon stocks in 1982.
62. Fishery openings in Area 5-1 in August and early September would have targeted on District 101, Skeena and Nass Rivers, Area 1, and Area 3 pink salmon stocks in 1982.
63. Fishery openings in Area 1 in August and early September would have targeted on Districts 101-103, 106-107, Skeena River, Area 1, and Area 3 pink salmon stocks in 1982.
64. Fishery openings in Portland Inlet, Kwinamass Bay, and Khuyzymateen Inlet in August and early September would have targeted on Districts 101, 102, Area 1, and Area 3 pink salmon stocks in 1982.
65. Fishery openings in the lower Skeena River in August and early September would have targeted on Skeena River pink salmon stocks in 1982.
66. Fishery openings near Langara and Dundas Islands in June would have targeted on District 101, Skeena and Nass Rivers, and Area 1 sockeye salmon stocks in 1982.
67. Fishery openings in June near Tracy/Boston Rocks would have targeted on District 101, Nass River, and Area 1 sockeye, while openings near Stephens/Porcher Islands would have targeted on Skeena River, Area 1, and Area 5 sockeye salmon stocks in 1982.
68. Fishery openings in Portland Inlet and near Birnie/Maskelyne Islands in June would have targeted on Nass River and Area 1 sockeye stocks in 1982.
69. Fishery openings in July near Langara and Dundas Islands would have targeted on District 101, Skeena and Nass Rivers, Areas 1, 3, and 5 sockeye salmon stocks in 1982.
70. Fishery openings in July off Tracy/Boston Rocks would have targeted on Skeena and Nass River sockeye salmon while openings during this period

near Stephens/Porcher Islands would have targeted on Skeena River and Area 5 sockeye salmon stocks in 1982.

71. Fishery openings in July near Birnie/Maskelyne Islands would have targeted on District 101, Skeena and Nass Rivers, and Area 1 sockeye salmon stocks in 1982.
72. Fishery openings in July in Area 1, Area 5, and on the lower Skeena River would have targeted on Skeena River sockeye salmon, while Portland Inlet openings during this period would have harvested primarily Nass and Skeena River sockeye salmon stocks in 1984.
73. Fishery openings in August and early September near Dundas Island, Tracy/Boston Rocks, and Stephens/Porcher Islands would have targeted primarily on Skeena River sockeye salmon stocks.
74. Fishery openings in August and early September near Birnie/Maskelyne Islands would have targeted on District 101 and Skeena River sockeye salmon, while openings during this period in Area 5-1 would have harvested Skeena River and Area 1 sockeye salmon in 1982.
75. A heterogeneous mixture of pink and sockeye salmon was noted along all of the Canadian release locations for the majority of the season, except for the lower Skeena River. This suggests that sound stock management strategies based on run timing to harvest fish in these areas would be difficult to implement.
76. The most homogeneous mixture of pink and sockeye salmon was noted in the lower Skeena River, all season, and to a lesser extent near Dundas Island, Tracy/Boston Rocks, and Stephens/Porcher Islands in August. This suggests that derivation of sound stock management strategies based on run timing for harvesting pink or sockeye salmon at these locations and during these time periods would be feasible.

Research conducted on the migration routes, run timing, and stock intermingling of pink and sockeye salmon in southern Southeastern Alaska and northern British Columbia from the mid-1920's to the early 1980's has identified major migratory routes, established broad run timing categories, and derived limited stock intermingling data on both species.

A comparison of this data with preliminary results of the 1982 U.S./Canada tagging project produced only one major contradiction. As early as the mid-1920's, Rich (1926) stated that the lack of pink salmon tag recoveries from outside southern Southeastern Alaska, except Canadian recoveries, illustrated the general integrity of this area's pink salmon stocks. The results of the 1982 U.S./Canada research indicate that early in the season (i.e., June), pink and sockeye salmon stocks from northern Southeastern Alaska, the Yakutat area, and even Prince William Sound are mixed with southern Southeastern Alaska and northern British Columbia stocks off Langara, Dall, and Noyes Islands. While the relative abundance of stocks other than those of southern Southeastern Alaska and northern British Columbia in this area are currently thought to be small during most of the fishing season, the results of the 1982 study which provide a one year, in-depth picture of migratory

routes, run timing, and stock intermingling data for both species emphasize the need for verification through additional years of research.

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APPENDICES

Appendix Table 1. Summary of commercial and in-stream recoveries of pink salmon tagged in southern Southeastern Alaska, 1924-1981.

Tagging Areas	Sumner Strait		Clarence Strait Northern		Clarence Strait Central		Clarence Strait Southeast		Clarence Strait Southwest	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Sumner Strait	5,387	69.9%	1,823	23.7%	169	2.2%	127	1.6%	97	1.3%
Northern Clarence Strait	13	1.9%	292	42.2%	180	26.0%	24	3.5%	3	0.4%
Central Clarence Strait	6	0.3%	596	31.1%	268	14.0%	112	5.8%	356	18.6%
Ernest Sound (Union Bay)	-	-	3	10.0%	1	3.3%	8	26.7%	1	3.3%
-79- Southeast Clarence Strait	140	0.3%	809	15.8%	607	11.8%	1,015	19.8%	840	16.4%
Southwest Clarence Strait	51	1.3%	159	4.1%	602	15.7%	974	25.3%	1,348	35.1%
Prince of Wales Island Cordova Bay	6	0.5%	22	1.7%	103	7.7%	79	5.9%	122	9.2%
Prince of Wales Island Southwest Coast	62	1.0%	309	5.2%	178	3.0%	217	3.6%	260	4.3%
Prince of Wales Island Northwest Coast	13	0.6%	27	1.2%	11	0.5%	13	0.6%	12	0.5%
Total	5,678	19.5%	4,040	13.9%	2,119	7.3%	2,569	8.8%	3,039	10.4%

-Continued-

Appendix Table 1. Summary of commercial and in-stream recoveries of pink salmon tagged in southern Southeastern Alaska, 1924-1981 (continued).

Tagging Areas	Portland Canal		Ernest Sound		Prince of Wales Island Southwest Coast		Prince of Wales Island Northwest Coast		Prince of Wales Island Cordova Bay	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Sumner Strait	-	0.0%	2	.03%	19	0.2%	24	0.3%	4	.05%
Northern Clarence Strait	-	0.0%	163	23.6%	2	0.2%	8	1.2%	2	0.2%
Central Clarence Strait	4	0.2%	467	24.4%	4	0.2%	12	0.6%	12	0.6%
Ernest Sound (Union Bay)	-	0.0%	15	50.0%	-	0.0%	-	0.0%	-	0.0%
Southeast Clarence Strait	357	6.9%	-	0.0%	61	1.2%	53	1.0%	54	1.0%
Southwest Clarence Strait	7	0.2%	-	0.0%	139	3.6%	137	3.6%	211	5.5%
Prince of Wales Island Cordova Bay	-	0.0%	-	0.0%	599	45.0%	27	2.0%	335	25.2%
Prince of Wales Island Southwest Coast	-	0.0%	-	0.0%	503	8.4%	1,117	18.6%	851	14.2%
Prince of Wales Island Northwest Coast	-	0.0%	-	0.0%	30	1.3%	2,042	88.4%	7	0.3%
Total	368	1.3%	647	2.2%	1,357	4.7%	3,420	11.8%	1,476	5.1%

-Continued-

Appendix Table 1. Summary of commercial and in-stream recoveries of pink salmon tagged in southern Southeastern Alaska, 1924-1981 (continued).

Tagging Areas	British Columbia		Unknown		Total Number of Releases	Recovery Number & Percent of Total Release	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>		<u>Number</u>	<u>Percent</u>
Sumner Strait	29	0.4%	21	0.3%	20,886	7,702	36.9%
Northern Clarence Strait	1	0.1%	4	0.6%	2,584	692	26.8%
Central Clarence Strait	4	0.2%	76	4.0%	9,636	1,917	20.0%
Ernest Sound (Union Bay)	1	3.3%	1	3.3%	355	30	8.5%
Southeast Clarence Strait	349	6.8%	976	19.0%	21,843	5,261	23.5%
Southwest Clarence Strait	-	0.0%	216	5.6%	9,260	3,844	41.5%
Prince of Wales Island ¹ Cordova Bay	4	0.3%	34	2.6%	3,678	1,331	36.2%
Prince of Wales Island ¹ Southwest Coast	2,019	33.7%	481	8.0%	20,563	5,997	29.2%
Prince of Wales Island ¹ Northwest Coast	4	0.2%	152	6.6%	5,632	2,311	41.0%
Total	2,410	8.3%	1,961	6.7%	94,437	29,085	30.8%

¹ Includes in-stream recoveries.

Appendix Table 2. Summary of commercial recoveries of pink salmon tagged in British Columbia, 1944-1968.

BRITISH COLUMBIA TAG RECOVERY AREAS								
Tagging Area	Johnstone Strait		Fraser River		Washington		Area 1	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Johnstone Strait	6	16.0	30	82.0	1	2.0	-	-
Sooke Fish Traps								
Strait of Juan De Fuca	-	-	8	57.0	6	43.0	-	-
Area 3 (1945)	-	-	-	-	-	-	-	-
Area 4 (1945)	-	-	-	-	-	-	-	-
Area 3 (1946)	-	-	-	-	-	-	-	-
Area 4 (1946)	-	-	-	-	-	-	-	-
Area 3 (1947)	-	-	-	-	-	-	-	-
Area 4 (1947)	-	-	-	-	-	-	-	-
Area 3 (1948)	-	-	-	-	-	-	-	-
Area 4 (1948)	-	-	-	-	-	-	-	-
Southern Southeast Alaska (1956)	-	-	-	-	-	-	-	-
Area 3 (1956)	-	-	-	-	-	-	-	-
Area 4 (1956)	-	-	-	-	-	-	-	-
Area 5 (1956)	-	-	-	-	-	-	-	-
Area 3 (1957)	-	-	-	-	-	-	-	-
Area 4 (1957)	-	-	-	-	-	-	-	-
Area 5 (1957)	-	-	-	-	-	-	-	-
Area 3 (1958)	-	-	-	-	-	-	-	-
Area 4 (1958)	-	-	-	-	-	-	-	-
Area 5 (1958)	-	-	-	-	-	-	-	-
Dixon Entrance (1966)	-	-	-	-	-	-	138	12.4
Dundas Island (1966)	-	-	-	-	-	-	-	-
Browning Entrance (1966)	-	-	-	-	-	-	-	-
Hecate Strait (1966)	-	-	-	-	-	-	-	-
Dixon Entrance (1967)	-	-	-	-	-	-	14	2.3
Dundas Island (1967)	-	-	-	-	-	-	-	-
Browning Entrance (1967)	-	-	-	-	-	-	-	-
Hecate Strait (1967)	-	-	-	-	-	-	-	-
Dixon Entrance (1968)	-	-	-	-	-	-	103	29.6
Dundas Island (1968)	-	-	-	-	-	-	-	-
Browning Entrance (1968)	-	-	-	-	-	-	-	-
Hecate Strait (1968)	-	-	-	-	-	-	-	-
Total	6	.05	38	.3	7	.06	255	2.1

-Continued-

Appendix Table 2. Summary of commercial recoveries of pink salmon tagged in British Columbia, 1944-1968 (continued).

BRITISH COLUMBIA TAG RECOVERY AREAS									
Tagging Area		Area (2W 2E)		Area (3X 3Y 3Z)		Area 4		Area 5	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
Johnstone Strait		-	-	-	-	-	-	-	-
Sooke Fish Traps		-	-	-	-	-	-	-	-
Strait of Juan De Fuca		-	-	-	-	-	-	-	-
Area 3	(1945)	-	-	26	66.6	5	12.8	-	-
	4	-	-	3	3.3	89	96.7	-	-
Area 3	(1946)	-	-	-	-	-	-	-	-
	4	-	-	-	-	38	90.5	1	2.4
Area 3	(1947)	-	-	-	-	-	-	-	-
	4	-	-	-	-	82	98.8	-	-
Area 3	(1948)	-	-	11	91.7	-	-	1	8.3
	4	-	-	-	-	5	100.0	-	-
Southern Southeast Alaska (1956)		-	-	17	89.5	2	10.5	-	-
Area 3	(1956)	-	-	40	42.1	46	48.4	5	5.3
	4	-	-	-	-	1	100.0	-	-
	5	-	-	2	5.0	25	62.5	12	30.0
Area 3	(1957)	-	-	434	24.5	1250	70.5	28	1.6
	4	-	-	54	7.4	664	91.0	10	1.4
	5	-	-	20	3.9	221	43.1	264	51.5
Areas 3	(1958)	10	1.9	188	35.5	257	48.6	42	7.9
	4	1	.2	35	7.3	390	81.8	40	8.4
	5	5	.5	19	1.7	672	61.1	394	35.8
Dixon Entrance (1966)		9	.8	220	19.7	402	36.0	244	21.8
Dundas Island (1966)		-	-	226	33.6	322	47.8	93	13.8
Browning Entrance (1966)		-	-	54	8.5	262	41.4	278	43.9
Hecate Strait (1966)		-	-	1	50.0	-	-	-	-
Dixon Entrance (1967)		-	-	269	44.2	276	45.4	21	3.5
Dundas Island (1967)		-	-	135	93.7	9	6.3	-	-
Browning Entrance (1967)		-	-	1	20.0	4	80.0	-	-
Hecate Strait (1967)		-	-	-	-	1	100.0	-	-
Dixon Entrance (1968)		10	2.9	86	24.7	68	19.5	41	11.8
Dundas Island (1968)		-	-	773	74.6	244	23.6	50	4.8
Browning Entrance (1968)		-	-	190	30.4	242	38.7	89	14.2
Hecate Strait (1968)		-	-	181	16.4	270	24.4	262	23.7
Total		35	0.3	2985	25.0	5847	49.0	1875	15.6

-Continued-

Appendix Table 2. Summary of commercial recoveries of pink salmon tagged in British Columbia, 1944-1968 (continued).

<u>Tagging Area</u>		<u>BRITISH COLUMBIA TAG RECOVERY AREAS</u>							
		<u>Area 6</u>		<u>Area 7</u>		<u>Area 8</u>		<u>Area 9</u>	
		<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Johnstone Strait		-	-	-	-	-	-	-	-
Sooke Fish Traps		-	-	-	-	-	-	-	-
Strait of Juan De Fuca		-	-	-	-	-	-	-	-
Area 3	(1945)	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-
Area 3	(1946)	-	-	-	-	-	-	-	-
	4	3	7.1	-	-	-	-	-	-
Area 3	(1947)	-	-	-	-	-	-	-	-
	4	1	1.2	-	-	-	-	-	-
Area 3	(1948)	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-
Southern Southeast Alaska (1956)		-	-	-	-	-	-	-	-
Area 3	(1956)	4	4.2	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-
	5	1	2.5	-	-	-	-	-	-
Area 3	(1957)	17	1.0	17	1.0	9	0.5	4	0.2
	4	-	-	-	-	-	-	-	-
	5	8	1.6	-	-	-	-	-	-
Areas 3	(1958)	21	4.0	4	0.8	5	0.9	-	-
	4	6	1.3	1	0.2	1	0.2	1	0.2
	5	8	0.7	1	0.1	1	0.1	-	-
Dixon Entrance (1966)		104	9.3	-	-	-	-	-	-
Dundas Island (1966)		32	4.8	-	-	-	-	-	-
Browning Entrance (1966)		39	6.2	-	-	-	-	-	-
Hecate Strait (1966)		1	50.0	-	-	-	-	-	-
Dixon Entrance (1967)		28	4.6	-	-	-	-	-	-
Dundas Island (1967)		-	-	-	-	-	-	-	-
Browning Entrance (1967)		-	-	-	-	-	-	-	-
Hecate Strait (1967)		-	-	-	-	-	-	-	-
Dixon Entrance (1968)		40	11.5	-	-	-	-	-	-
Dundas Island (1968)		69	6.7	-	-	-	-	-	-
Browning Entrance (1968)		105	16.8	-	-	-	-	-	-
Hecate Strait (1968)		393	35.5	-	-	-	-	-	-
Total		880	7.37	23	0.2	16	0.1	5	0.04

-Continued-

Appendix Table 2. Summary of commercial recoveries of pink salmon tagged in British Columbia, 1944-1968 (continued).

BRITISH COLUMBIA TAG RECOVERY AREAS								
Tagging Area		Area 10		Area 11		Area 12		Total
		Number	Percent	Number	Percent	Number	Percent	Number Percent
Johnstone Strait		-	-	-	-	-	-	37 100.0
Sooke Fish Traps								
Strait of Juan De Fuca		-	-	-	-	-	-	14 100.0
Area 3	(1945)	-	-	-	-	-	-	31 79.5
	4	-	-	-	-	-	-	92 100.0
Area 3	(1946)	-	-	-	-	-	-	- -
	4	-	-	-	-	-	-	42 100.0
Area 3	(1947)	-	-	-	-	-	-	- -
	4	-	-	-	-	-	-	83 100.0
Area 3	(1948)	-	-	-	-	-	-	12 100.0
	4	-	-	-	-	-	-	5 100.0
Southern Southeast Alaska (1956)		-	-	-	-	-	-	19 79.1
Area 3	(1956)	-	-	-	-	-	-	95 96.0
	4	-	-	-	-	-	-	1 100.0
	5	-	-	-	-	-	-	40 100.0
Area 3	(1957)	2	0.1	-	-	13	0.7	1772 94.6
	4	-	-	-	-	2	0.3	730 99.3
	5	-	-	-	-	-	-	513 100.0
Areas 3	(1958)	-	-	-	-	1	0.2	528 52.8
	4	-	-	-	-	2	0.4	477 91.9
	5	-	-	-	-	-	-	1100 98.0
Dixon Entrance (1966)		-	-	-	-	-	-	1117 38.4
Dundas Island (1966)		-	-	-	-	-	-	673 90.2
Browning Entrance (1966)		-	-	-	-	-	-	633 88.9
Hecate Strait (1966)		-	-	-	-	-	-	2 8.3
Dixon Entrance (1967)		-	-	-	-	-	-	608 92.8
Dundas Island (1967)		-	-	-	-	-	-	144 95.4
Browning Entrance (1967)		-	-	-	-	-	-	5 100.0
Hecate Strait (1967)		-	-	-	-	-	-	1 100.0
Dixon Entrance (1968)		-	-	-	-	-	-	348 57.2
Dundas Island (1968)		-	-	-	-	-	-	1136 47.0
Browning Entrance (1968)		-	-	-	-	-	-	626 66.2
Hecate Strait (1968)		-	-	-	-	-	-	1106 79.2
Total		2	0.02	-	-	18	0.2	11,992 71.3

-Continued-

Appendix Table 2. Summary of commercial recoveries of pink salmon tagged in British Columbia, 1944-1968 (continued).

Tagging Area	ALASKA TAG RECOVERY AREAS							
	District 101		District 102		District 103		District 104	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Johnstone Strait	-	-	-	-	-	-	-	-
Sooke Fish Traps								
Straits of Juan De Fuca	-	-	-	-	-	-	-	-
Area 3 (1945)	8	100.0	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-
Area 3 (1946)	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-
Area 3 (1947)	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-
Area 3 (1948)	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-
Southern Southeast Alaska (1956)	5	100.0	-	-	-	-	-	-
Area 3 (1956)	4	100.0	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-
Area 3 (1957)	99	97.1	1	1.0	-	-	-	-
4	5	100.0	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-
Areas 3 (1958)	420	89.0	21	4.5	3	0.6	3	0.6
4	39	92.6	2	4.8	1	2.4	-	-
5	19	86.4	3	13.6	-	-	-	-
Dixon Entrance (1966)	631	35.2	679	37.9	127	7.1	14	0.8
Dundas Island (1966)	64	87.7	6	8.2	-	-	-	-
Browning Entrance (1966)	27	33.8	31	38.8	7	8.8	-	-
Hecate Strait (1966)	6	27.8	5	22.7	-	-	-	-
Dixon Entrance (1967)	36	76.6	5	10.6	5	10.6	2	4.3
Dundas Island (1967)	7	100.0	-	-	-	-	-	-
Browning Entrance (1967)	-	-	-	-	-	-	-	-
Hecate Strait (1967)	-	-	-	-	-	-	-	-
Dixon Entrance (1968)	180	69.2	47	18.1	11	4.2	-	-
Dundas Island (1968)	1119	87.2	103	8.0	14	1.1	1	0.08
Browning Entrance (1968)	279	87.2	17	5.3	1	0.3	2	0.6
Hecate Strait (1968)	241	83.1	31	10.7	2	0.7	1	0.3
Total	3189	66.0	951	19.7	171	3.5	23	0.5

-Continued-

Appendix Table 2. Summary of commercial recoveries of pink salmon tagged in British Columbia, 1944-1968 (continued).

<u>Tagging Area</u>		<u>ALASKA TAG RECOVERY AREAS</u>							
		<u>District 105</u>		<u>District 106</u>		<u>District 107</u>		<u>Total</u>	
		<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Johnstone Strait		-	-	-	-	-	-	-	-
Sooke Fish Traps									
Strait of Juan De Fuca		-	-	-	-	-	-	-	-
Area 3	(1945)	-	-	-	-	-	-	8	20.5
4		-	-	-	-	-	-	-	-
Area 3	(1946)	-	-	-	-	-	-	-	-
4		-	-	-	-	-	-	-	-
Area 3	(1947)	-	-	-	-	-	-	-	-
4		-	-	-	-	-	-	-	-
Area 3	(1948)	-	-	-	-	-	-	-	-
4		-	-	-	-	-	-	-	-
Southern Southeast Alaska	(1956)	-	-	-	-	-	-	5	20.8
Area 3	(1956)	-	-	-	-	-	-	4	4.0
4		-	-	-	-	-	-	-	-
5		-	-	-	-	-	-	-	-
Area 3	(1957)	-	-	-	-	2	2.9	102	5.4
4		-	-	-	-	-	-	5	0.7
5		-	-	-	-	-	-	-	-
Areas 3	(1958)	-	-	4	0.8	1	0.2	472	47.2
4		-	-	-	-	-	-	42	8.1
5		-	-	-	-	-	-	22	2.0
Dixon Entrance	(1966)	7	0.4	150	8.4	184	10.3	1792	61.6
Dundas Island	(1966)	-	-	1	1.4	2	2.8	73	9.8
Browning Entrance	(1966)	-	-	6	7.5	8	10.0	80	11.1
Hecate Strait	(1966)	-	-	-	-	11	50.0	22	91.7
Dixon Entrance	(1967)	-	-	4	8.5	-	-	47	7.2
Dundas Island	(1967)	-	-	-	-	-	-	7	4.6
Browning Entrance	(1967)	-	-	-	-	-	-	-	-
Hecate Strait	(1967)	-	-	-	-	-	-	-	-
Dixon Entrance	(1968)	-	-	14	5.4	8	3.1	260	42.8
Dundas Island	(1968)	-	-	24	1.3	22	1.7	1283	53.0
Browning Entrance	(1968)	-	-	12	3.8	9	2.8	320	33.8
Hecate Strait	(1968)	-	-	13	4.5	15	5.2	290	20.8
Total		7	0.1	228	4.7	262	5.4	4834	28.7

-Continued-

Appendix Table 2. Summary of commercial recoveries of pink salmon tagged in British Columbia, 1944-1968 (continued).

<u>Tagging Area</u>	<u>Total Number Of Releases</u>	<u>Recovery Number and Percent of Total Release</u>	
		<u>Number</u>	<u>Percent</u>
Johnstone Strait	468	37	7.9
Sooke Fish Traps			
Strait of Juan De Fuca	185	14	7.6
Area 3 (1945)	312	39	12.5
Area 4	1282	92	7.2
Area 3 (1946)	3	-	-
Area 4	287	42	14.6
Area 3 (1947)	11	-	-
Area 4	608	83	13.7
Area 3 (1948)	124	12	9.8
Area 4	20	5	25.0
Southern Southeast Alaska (1956)	78	24	30.8
Area 3 (1956)	405	99	24.4
Area 4	3	1	33.0
Area 5	768	40	5.2
Area 3 (1957)	4048	1874	46.3
Area 4	1468	735	50.0
Area 5	1398	513	36.7
Area 3 (1958)	2794	1000	35.1
Area 4	1318	519	39.4
Area 5	2516	1122	44.6
Dixon Entrance (1966)	9795	2909	29.7
Dundas Island (1966)	2363	746	31.6
Browning Entrance (1966)	1883	713	37.8
Hecate Strait (1966)	77	24	31.2
Dixon Entrance (1967)	4361	655	15.1
Dundas Island (1967)	400	151	37.8
Browning Entrance (1967)	20	5	25.0
Hecate Strait (1967)	27	1	3.7
Dixon Entrance (1968)	3738	608	16.3
Dundas Island (1968)	9331	2419	25.9
Browning Entrance (1968)	3498	946	27.0
Hecate Strait (1968)	5674	1396	24.6
Total	59263	16826	28.4

Appendix Table 3. Summary of commercial recoveries of sockeye salmon tagged in southern Southeastern Alaska, 1924-1958.

Tagging Areas	U.S. RECOVERY LOCATIONS							
	Sumner Strait		Ernest Sound Anan		Stikine		Clarence Strait Behm Canal	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Sumner Strait Ruins Point	22	52.4	-	-	2	4.8	1	2.4
Sumner Strait Ruins Point	38	33.6	5	4.4	5	4.4	5	4.4
S.W. Clarence Strait Stone Rock Bay	-	-	-	-	-	-	-	-
Cape Chacon	-	-	-	-	-	-	-	-
Southern Clarence Strait Cape Fox	-	-	-	-	-	-	-	-
Clarence Strait - S.E. Nelson Cove	-	-	-	-	-	-	-	-
Clarence Strait - S.W. Stone Rock Bay	-	-	-	-	-	-	-	-
West Coast - Cordova Bay, Long Island	-	-	-	-	-	-	-	-
Sumner Strait Point Colpoys	13	10.3	7	5.6	13	10.3	2	1.6
Sumner Strait Point Colpoys	30	28.9	7	6.7	1	0.1	2	1.9
Cape Decision	1	100.0	-	-	-	-	-	-
Clarence Strait - S.E. Nelson Cove & Dall Head	-	-	-	-	-	-	3	50.0
Southern District Cape Fox, Sitklon Island and Kanaganut Island	-	-	-	-	-	-	-	-
Clarence Strait Kaasan Bay to Windfall Harbor	-	-	-	-	-	-	-	-
Clarence Strait Central, S.E. and S.W.	No Recoveries Listed by Area							
West Coast Prince of Wales Island	-	-	-	-	-	-	13	12.4
Cape Addington	-	-	-	-	-	-	-	-
Cape Ulitka	-	-	-	-	-	-	-	-
West Coast - S.W. Prince of Wales Island	-	-	-	-	-	-	-	-
Cape Addington	2	0.8	-	-	-	-	56	23.0
Cape Ulitka	1	1.2	-	-	-	-	11	13.3
Granite Point	-	-	-	-	-	-	1	9.1
West Coast - N.W. Prince of Wales Island	-	-	-	-	-	-	-	-
Point Desconocida	2	1.4	-	-	-	-	3	2.0
Tranquil Point	-	-	-	-	-	-	-	-
West Coast - Cordova Bay, McLeod Bay	-	-	-	-	-	-	8	25.8
<u>Total</u>	109	7.9	19	1.4	21	1.5	105	7.7

Appendix Table 3. Summary of commercial recoveries of sockeye salmon tagged in southern Southeastern Alaska, 1924-1968 (continued).

Tagging Areas	U.S. RECOVERY LOCATIONS							
	Clarence Strait Northern		Clarence Strait Central		Clarence Strait Southeastern		Clarence Strait Southwestern	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Sumner Strait Ruins Point	3	7.1	6	14.2	2	4.8	2	4.8
Sumner Strait Ruins Point	14	12.4	25	22.1	7	6.2	8	7.0
S.W. Clarence Strait Stone Rock Bay Cape Chacon	-	-	-	-	4	11.1	29	80.6
Southern Clarence Strait Cape Fox	-	-	2	0.8	6	2.4	2	0.8
Clarence Strait - S.E. Nelson Cove	-	-	3	30.0	3	30.0	1	10.0
Clarence Strait - S.W. Stone Rock Bay	-	-	-	-	-	-	1	100.0
West Coast - Cordova Bay, Long Island	-	-	-	-	1	16.7	1	16.7
Sumner Strait Point Colpoys	37	29.4	17	13.5	9	7.1	15	11.9
Sumner Strait Point Colpoys Cape Decision	27	26.0	13	12.5	16	15.4	3	2.9
Clarence Strait - S.E. Nelson Cove & Dall Head	-	-	-	-	2	33.3	-	-
Southern District Cape Fox, Sitklon Island and Kanaganut Island	-	-	-	-	13	51.9	-	-
Clarence Strait Kaasan Bay to Windfall Harbor	-	-	-	-	-	-	3	21.4
Clarence Strait Central, S.E. and S.W.	No Recoveries Listed by Area							
West Coast Prince of Wales Island Cape Addington Cape Ulitka	1	1.0	-	-	-	-	5	4.8
West Coast - S.W. Prince of Wales Island Cape Addington Cape Ulitka Granite Point	31	12.7	-	-	-	-	-	-
	5	6.0	-	-	-	-	-	-
	1	9.1	-	-	-	-	-	-
West Coast - N.W. Prince of Wales Island Point Descunocida Tranquil Point	2	1.4	-	-	-	-	-	-
	1	5.6	-	-	-	-	-	-
West Coast - Cordova Bay, McLeod Bay	3	9.7	-	-	-	-	-	-
Total	125	9.1	66	4.8	63	4.6	70	5.1

Appendix Table 3. Summary of commercial recoveries of sockeye salmon tagged in southern Southeastern Alaska, 1924-1968 (continued).

Tagging Areas	U.S. RECOVERY LOCATIONS							
	Southern S.E. Alaska General		Portland Canal		Prince of Wales Island Cordova		Prince of Wales Island Southwestern	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Sumner Strait Ruins Point	3	7.1	-	-	-	-	-	-
Sumner Strait Ruins Point	3	2.7	-	-	-	-	-	-
S.W. Clarence Strait Stone Rock Bay Cape Chacon	-	-	-	-	3	8.3	-	-
Southern Clarence Strait Cape Fox	243	96.1	-	-	-	-	-	-
Clarence Strait - S.E. Nelson Cove	3	30.0	-	-	-	-	-	-
Clarence Strait - S.W. Stone Rock Bay	-	-	-	-	-	-	-	-
West Coast - Cordova Bay, Long Island	-	-	-	-	2	33.3	-	-
Sumner Strait Point Colpoys	-	-	-	-	-	-	-	-
Sumner Strait Point Colpoys Cape Decision	4	3.9	-	-	1	0.1	-	-
Clarence Strait - S.E. Nelson Cove & Dall Head	1	16.7	-	-	-	-	-	-
Southern District Cape Fox, Sitklon Island and Kanaganut Island	9	40.9	-	-	-	-	-	-
Clarence Strait Kaasan Bay to Windfall Harbor	11	78.6	-	-	-	-	-	-
Clarence Strait Central, S.E. and S.W.	No Recoveries		Listed by Area					
West Coast Prince of Wales Island Cape Addington Cape Ulitka	2	1.9	2	1.9	9	8.6	67	63.8
West Coast - S.W. Prince of Wales Island Cape Addington Cape Ulitka Granite Point	21	8.6	-	-	34	13.9	95	38.9
	5	6.0	-	-	17	20.5	33	39.8
	5	45.5	-	-	-	-	4	36.4
West Coast - N.W. Prince of Wales Island Point Desconocida Tranquil Point	2	1.4	-	-	4	2.7	59	40.1
	1	5.6	-	-	4	22.2	7	38.9
West Coast - Cordova Bay, McLeod Bay	-	-	-	-	17	54.8	3	9.7
Total	313	22.8	2	0.1	91	6.6	268	19.5

-Continued-

Appendix Table 3. Summary of commercial recoveries of sockeye salmon tagged in southern Southeastern Alaska, 1924-1968 (continued).

Tagging Areas	U.S. RECOVERY LOCATIONS				B.C. RECOVERY LOCATIONS			
	Prince of Wales Island		Total		Area 1		Area 2	
	Northwestern							
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Sumner Strait Ruins Point	1	2.4	42	82.4	-	-	-	-
Sumner Strait Ruins Point	3	2.7	113	92.6	-	-	-	-
S.W. Clarence Strait Stone Rock Bay Cape Chacon	-	-	36	97.3	-	-	-	-
Southern Clarence Strait Cape Fox	-	-	253	82.7	-	-	-	-
Clarence Strait - S.E. Nelson Cove	-	-	10	90.9	-	-	-	-
Clarence Strait - S.W. Stone Rock Bay	-	-	1	100.0	-	-	-	-
West Coast - Cordova Bay, Long Island	2	33.3	6	100.0	-	-	-	-
Sumner Strait Point Colpoys	7	5.6	126	98.4	-	-	-	-
Sumner Strait Point Colpoys Cape Decision	-	-	104	89.7	-	-	-	-
	-	-	1	33.3	-	-	-	-
Clarence Strait - S.E. Nelson Cove & Dall Head	-	-	6	100.0	-	-	-	-
Southern District Cape Fox, Sitklon Island and Kanaganut Island	-	-	22	78.6	-	-	-	-
Clarence Strait Kaasan Bay to Windfall Harbor	-	-	14	93.3	-	-	-	-
Clarence Strait Central, S.E. and S.W.	No Recoveries		Listed by Area					
West Coast Prince of Wales Island Cape Addington Cape Ulitka	6	5.7	105	52.0	1	1.0	-	-
	-	-	-	-	-	-	-	-
West Coast - S.W. Prince of Wales Island Cape Addington Cape Ulitka Granite Point	5	2.0	244	56.7	2	1.0	-	-
	11	13.3	83	87.4	-	-	-	-
	-	-	11	64.7	-	-	-	-
West Coast - N.W. Prince of Wales Island Point Desconocida Tranquil Point	75	51.0	147	99.3	-	-	-	-
	4	22.2	18	94.7	-	-	-	-
West Coast - Cordova Bay, McLeod Bay	-	-	31	100.0	-	-	-	-
Total	114	8.3	1373	77.5	3	0.8	-	-

Appendix Table 3. Summary of commercial recoveries of sockeye salmon tagged in southern Southeastern Alaska, 1924-1968 (continued).

Tagging Areas	B.C. RECOVERY LOCATIONS							
	Area 3X		Area 3Y		Area 3Z		Area 4	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Sumner Strait Ruins Point	-	-	-	-	-	-	9	100.0
Sumner Strait Ruins Point	-	-	-	-	2	22.3	7	77.7
S.W. Clarence Strait Stone Rock Bay Cape Chacon	-	-	-	-	-	-	1	100.0
Southern Clarence Strait Cape Fox	-	-	-	-	47	90.4	5	9.6
Clarence Strait - S.E. Nelson Cove	-	-	-	-	-	-	1	100.0
Clarence Strait - S.W. Stone Rock Bay	-	-	-	-	-	-	-	-
West Coast - Cordova Bay, Long Island	-	-	-	-	-	-	-	-
Sumner Strait Point Colpoys	-	-	-	-	2	100.0	-	-
Sumner Strait Point Colpoys Cape Decision	-	-	-	-	1	8.3	4	33.3
Clarence Strait - S.E. Nelson Cove & Dall Head	-	-	-	-	-	-	-	-
Southern District Cape Fox, Sitklon Island and Kanaganut Island	-	-	-	-	6	100.0	-	-
Clarence Strait Kaasan Bay to Windfall Harbor	-	-	-	-	1	100.0	-	-
Clarence Strait Central, S.E. and S.W.	No Recoveries		Listed by Area					
West Coast Prince of Wales Island Cape Addington Cape Ulitka	-	-	6	6.2	5	5.2	66	68.0
	-	-	-	-	-	-	1	100.0
West Coast - S.W. Prince of Wales Island Cape Addington Cape Ulitka Granite Point	1	0.5	-	-	6	3.2	164	88.2
	1	8.3	-	-	2	16.7	8	66.7
	-	-	-	-	2	33.3	3	50.0
West Coast - N.W. Prince of Wales Island Point Desconocida Tranquil Point	-	-	-	-	1	100.0	-	-
	-	-	-	-	1	100.0	-	-
West Coast - Cordova Bay, McLeod Bay	-	-	-	-	-	-	-	-
Total	2	0.5	61	1.5	74	18.6	271	67.9

Appendix Table 3. Summary of commercial recoveries of sockeye salmon tagged in southern Southeastern Alaska, 1924-1968 (continued).

<u>Tagging Areas</u>	<u>B.C. RECOVERY LOCATIONS</u>							
	<u>Area 3 or 4</u>		<u>Area 5</u>		<u>Area 6</u>		<u>Area 7</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Sumner Strait Ruins Point	-	-	-	-	-	-	-	-
Sumner Strait Ruins Point	-	-	-	-	-	-	-	-
S.W. Clarence Strait Stone Rock Bay Cape Chacon	-	-	-	-	-	-	-	-
Southern Clarence Strait Cape Fox	-	-	-	-	-	-	-	-
Clarence Strait - S.E. Nelson Cove	-	-	-	-	-	-	-	-
Clarence Strait - S.W. Stone Rock Bay	-	-	-	-	-	-	-	-
West Coast - Cordova Bay, Long Island	-	-	-	-	-	-	-	-
Sumner Strait Point Colpoys	-	-	-	-	-	-	-	-
Sumner Strait Point Colpoys	7	58.3	-	-	-	-	-	-
Cape Decision	2	100.0	-	-	-	-	-	-
Clarence Strait - S.E. Nelson Cove & Dall Head	-	-	-	-	-	-	-	-
Southern District Cape Fox, Sitklon Island and Kanaganut Island	-	-	-	-	-	-	-	-
Clarence Strait Kaasan Bay to Windfall Harbor	-	-	-	-	-	-	-	-
Clarence Strait Central, S.E. and S.W.	No Recoveries		Listed by Area					
West Coast Prince of Wales Island Cape Addington Cape Ulitka	-	-	4	4.0	1	1.0	-	-
West Coast - S.W. Prince of Wales Island Cape Addington Cape Ulitka Granite Point	-	-	7	3.8	2	1.0	1	0.5
	-	-	1	8.3	-	-	-	-
	-	-	-	-	-	-	1	16.7
West Coast - N.W. Prince of Wales Island Point Desconocida Fauquill Point	-	-	-	-	-	-	-	-
West Coast - Cordova Bay, McLeod Bay	-	-	-	-	-	-	-	-
<u>Total</u>	9	2.3	12	3.0	3	0.8	2	0.5

Appendix Table 3. Summary of commercial recoveries of sockeye salmon tagged in southern Southeastern Alaska, 1924-1968 (continued).

B.C. RECOVERY LOCATIONS								
Tagging Areas	Area 8		Area 9		Area 10		Area 11	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Sumner Strait								
Ruins Point	-	-	-	-	-	-	-	-
Sumner Strait								
Ruins Point	-	-	-	-	-	-	-	-
S.W. Clarence Strait								
Stone Rock Bay								
Cape Chacon	-	-	-	-	-	-	-	-
Southern Clarence Strait								
Cape Fox	-	-	-	-	-	-	-	-
Clarence Strait - S.E.								
Nelson Cove	-	-	-	-	-	-	-	-
Clarence Strait - S.W.								
Stone Rock Bay	-	-	-	-	-	-	-	-
West Coast - Cordova								
Bay, Long Island	-	-	-	-	-	-	-	-
Sumner Strait								
Point Colpoys	-	-	-	-	-	-	-	-
Sumner Strait								
Point Colpoys	-	-	-	-	-	-	-	-
Cape Decision	-	-	-	-	-	-	-	-
Clarence Strait - S.E.								
Nelson Cove &								
Dall Head	-	-	-	-	-	-	-	-
Southern District								
Cape Fox, Sitklan								
Island and								
Kanaganut Island	-	-	-	-	-	-	-	-
Clarence Strait								
Kaasan Bay to								
Windfall Harbor	-	-	-	-	-	-	-	-
Clarence Strait Central,								
S.E. and S.W.	No Recoveries		Listed by Area					
West Coast Prince of Wales								
Island								
Cape Addington	-	-	-	-	-	-	-	-
Cape Ulitka	-	-	-	-	-	-	-	-
West Coast - S.W. Prince								
of Wales Island								
Cape Addington	1	0.5	1	0.5	-	-	-	-
Cape Ulitka	-	-	-	-	-	-	-	-
Granite Point	-	-	-	-	-	-	-	-
West Coast - N.W. Prince								
of Wales Island								
Point Desconocida	-	-	-	-	-	-	-	-
Tranquil Point	-	-	-	-	-	-	-	-
West Coast - Cordova								
Bay, McLeod Bay	-	-	-	-	-	-	-	-
Total	1	0.3	1	0.3	-	-	-	-

Appendix Table 3. Summary of commercial recoveries of sockeye salmon tagged in southern Southeastern Alaska, 1924-1968 (continued).

B.C. RECOVERY LOCATIONS							
Tagging Areas	Area 12		Total		Total Releases	Recovery Number and Percent of Total Releases	
	Number	Percent	Number	Percent		Number	Percent
Sumner Strait Ruins Point	-	-	9	17.6	250	51	20.4
Sumner Strait Ruins Point	-	-	9	6.4	363	122	33.6
S.W. Clarence Strait Stone Rock Bay Cape Chacon	-	-	1	2.7	121	37	30.6
Southern Clarence Strait Cape Fox	-	-	52	17.0	761	306	40.2
Clarence Strait - S.E. Nelson Cove	-	-	1	9.1	68	11	16.2
Clarence Strait - S.W. Stone Rock Bay	-	-	-	-	4	1	25.0
West Coast - Cordova Bay, Long Island	-	-	-	-	55	6	10.9
Sumner Strait Point Colpoys	-	-	2	1.6	705	128	18.2
Sumner Strait Point Colpoys	-	-	12	10.3	383	116	30.3
Cape Decision	-	-	2	66.7	29	3	10.3
Clarence Strait - S.E. Nelson Cove & Dall Head	-	-	-	-	11	6	51.6
Southern District Cape Fox, Sitklon Island and Kanaganut Island	-	-	6	21.4	109	28	25.7
Clarence Strait Kaasan Bay to Windfall Harbor	-	-	1	6.7	61	15	24.6
Clarence Strait Central, S.E. and S.W.	No Recoveries		Listed by Area				
West Coast Prince of Wales Island							
Cape Addington	4	4.0	97	48.0	367	179	48.8
Cape Ulitka	-	-	1	100.0	500	202	40.4
West Coast - S.W. Prince of Wales Island							
Cape Addington	1	0.5	186	43.3	1	1	100.0
Cape Ulitka	-	-	12	12.6	1119	430	38.4
Granite Point	-	-	6	35.3	289	95	32.9
West Coast - N.W. Prince of Wales Island							
Point Desconocida	-	-	1	0.7	19	17	89.5
Tranquil Point	-	-	1	5.3	594	148	24.9
West Coast - Cordova Bay, McLeod Bay	-	-	-	-	91	31	34.1
Total	5	1.3	399	22.5	5900	1933	32.8

Appendix Table 4. Summary of commercial recoveries of sockeye salmon tagged in British Columbia, 1944-1968.

BRITISH COLUMBIA TAG RECOVERY AREAS									
Tagging Area		Area 1		Area 2 (2E & 2W)		Area 3 (3X, 3Y, 3Z)		Area 4	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
Haystack Island Area 3Y		-	-	-	-	93	69.0	13	9.7
Area 3 4 5	(1944)	-	-	-	-	3	75.0	-	-
		-	-	-	-	4	0.8	442	97.6
		-	-	-	-	-	-	3	5.0
Area 3 4 5	(1945)	-	-	-	-	14	77.8	4	22.2
		-	-	-	-	9	1.1	777	98.2
		-	-	-	-	-	-	1	7.7
Area 3 4 5	(1946)	-	-	-	-	3	100.0	-	-
		-	-	-	-	10	0.9	1104	97.6
		-	-	-	-	-	-	4	6.7
Area 3 4 5	(1947)	-	-	-	-	2	66.7	1	33.3
		-	-	-	-	14	1.1	1204	98.5
		-	-	-	-	-	-	3	9.8
Area 3 4	(1948)	-	-	-	-	12	80.0	3	20.0
		-	-	-	-	3	0.4	846	99.4
Southeastern Alaska		(1956)	-	-	-	-	-	-	-
Area 3 4 5	(1956)	-	-	-	-	9	24.3	26	70.3
		-	-	-	-	1	6.6	14	93.4
		-	-	-	-	-	-	2	100.0
Area 3 4 5	(1957)	-	-	-	-	170	25.9	459	70.0
		-	-	-	-	18	16.7	89	82.4
		-	-	-	-	1	6.7	12	80.0
Area 3 4 5	(1958)	-	-	1	0.5	27	12.2	183	82.8
		-	-	-	-	4	2.6	149	96.1
		-	-	-	-	2	2.6	67	85.9
Dixon Entrance		(1966)	1	2.8	-	52	19.7	176	66.7
Dundas Island		(1966)	-	-	-	100	13.5	574	77.6
Dixon Entrance		(1966)	1	0.2	-	95	21.2	347	77.5
Dundas Island		(1967)	-	-	-	23	14.8	121	78.1
Dixon Entrance		(1968)	-	-	-	-	-	-	-
Dundas Island		(1968)	-	-	-	84	27.5	210	68.6
Total		2	0.02	1	0.01	753	9.4	6834	84.9

Appendix Table 4. Summary of commercial recoveries of sockeye salmon tagged in British Columbia, 1944-1968 (continued).

BRITISH COLUMBIA TAG RECOVERY AREAS										
Tagging Area			Area 5		Area 6		Area 7		Area 8	
			Number	Percent	Number	Percent	Number	Percent	Number	Percent
Haystack Island Area 3Y			1	0.7	-	-	-	-	-	-
Area	3	(1944)	-	-	-	-	-	-	-	-
	4		4	0.9	2	0.4	-	-	-	-
	5		144	57.3	1	0.7	-	-	-	-
Area	3	(1945)	-	-	-	-	-	-	-	-
	4		-	-	-	-	-	-	-	-
	5		12	92.3	-	-	-	-	-	-
Area	3	(1946)	-	-	-	-	-	-	-	-
	4		1	0.08	6	0.5	-	-	-	-
	5		56	93.3	-	-	-	-	-	-
Area	3	(1947)	-	-	-	-	-	-	-	-
	4		4	0.3	-	-	-	-	-	-
	5		34	91.2	-	-	-	-	-	-
Area	3	(1948)	-	-	-	-	-	-	-	-
	4		2	0.2	-	-	-	-	-	-
Southeastern Alaska (1956)			-	-	-	-	-	-	-	-
Area	3	(1956)	2	5.4	-	-	-	-	-	-
	4		-	-	-	-	-	-	-	-
	5		-	-	-	-	-	-	-	-
Area	3	(1957)	20	3.0	2	0.3	2	0.3	-	-
	4		-	-	-	-	-	-	-	-
	5		2	13.3	2	13.3	-	-	-	-
Area	3	(1958)	7	3.0	2	0.9	-	-	1	0.5
	4		2	1.3	-	-	-	-	-	-
	5		9	11.5	-	-	-	-	-	-
Dixon Entrance (1966)			26	9.8	9	3.4	-	-	-	-
Dundas Island (1966)			58	7.8	8	1.0	-	-	-	-
Dixon Entrance (1967)			3	0.7	2	0.5	-	-	-	-
Dundas Island (1967)			8	5.2	3	1.9	-	-	-	-
Dixon Entrance (1968)			-	-	-	-	-	-	-	-
Dundas Island (1968)			6	1.9	6	1.9	-	-	-	-
Total			399	5.0	43	0.5	2	0.02	1	0.01

-Continued-

Appendix Table 4. Summary of commercial recoveries of sockeye salmon tagged in British Columbia, 1944-1968 (continued).

BRITISH COLUMBIA TAG RECOVERY AREAS									
Tagging Area		Area 9		Area 10		Area 11		Area 12	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
Haystack Island									
Area 3Y		-	-	-	-	-	-	-	-
Area 3	(1944)	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-
Area 3	(1945)	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	1	0.1
	5	-	-	-	-	-	-	-	-
Area 3	(1946)	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-
Area 3	(1947)	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-
	5	1	0.08	-	-	-	-	-	-
Area 3	(1948)	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-
Southeastern Alaska									
(1956)		-	-	-	-	-	-	-	-
Area 3	(1956)	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-
Area 3	(1957)	-	-	-	-	-	-	3	0.5
	4	-	-	-	-	-	-	1	0.9
	5	-	-	-	-	-	-	-	-
Area 3	(1958)	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-
Dixon Entrance (1966)		-	-	-	-	-	-	-	-
Dundas Island (1966)		-	-	-	-	-	-	-	-
Dixon Entrance (1967)		-	-	-	-	-	-	-	-
Dundas Island (1967)		-	-	-	-	-	-	-	-
Dixon Entrance (1968)		-	-	-	-	-	-	-	-
Dundas Island (1968)		-	-	-	-	-	-	-	-
Total		1	0.01	-	-	-	-	5	0.06

-Continued-

Appendix Table 4. Summary of commercial recoveries of sockeye salmon tagged in British Columbia, 1944-1968 (continued).

<u>Tagging Area</u>		<u>SOUTHEAST ALASKA TAG RECOVERY AREAS</u>							
		<u>British Columbia</u>		<u>District 101</u>		<u>District 102</u>		<u>District 103</u>	
		<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Haystack Island Area 3Y		107	80.0	16	59.3	8	29.6	-	-
Area 3	(1944)	3	75.0	1	100.0	-	-	-	-
	4	453	100.0	-	-	-	-	-	-
	5	148	100.0	-	-	-	-	-	-
Area 3	(1945)	18	100.0	-	-	-	-	-	-
	4	787	100.0	-	-	-	-	-	-
	5	13	100.0	-	-	-	-	-	-
Area 3	(1946)	3	100.0	-	-	-	-	-	-
	4	1131	100.0	-	-	-	-	-	-
	5	60	100.0	-	-	-	-	-	-
Area 3	(1947)	3	100.0	-	-	-	-	-	-
	4	1223	100.0	-	-	-	-	-	-
	5	37	100.0	-	-	-	-	-	-
Area 3	(1948)	15	100.0	-	-	-	-	-	-
	4	851	100.0	-	-	-	-	-	-
Southeastern Alaska (1956)		-	-	-	-	-	-	-	-
Area 3	(1956)	37	97.4	1	100.0	-	-	-	-
	4	15	100.0	-	-	-	-	-	-
	5	2	100.0	-	-	-	-	-	-
Area 3	(1957)	656	98.6	8	88.9	-	-	-	-
	4	108	99.1	1	100.0	-	-	-	-
	5								
Area 3	(1958)	221	94.1	11	84.6	2	15.4	-	-
	4	155	100.0	-	-	-	-	-	-
	5	78	100.0	-	-	-	-	-	-
Dixon Entrance	(1966)	264	88.0	23	63.9	7	19.4	1	2.8
Dundas Island	(1966)	740	95.2	34	91.9	2	5.4	-	-
Dixon Entrance	(1967)	448	97.0	12	85.7	-	-	-	-
Dundas Island	(1967)	155	97.5	4	100.0	-	-	-	-
Dixon Entrance	(1968)	-	-	-	-	-	-	-	-
Dundas Island	(1968)	306	91.6	24	85.7	2	1.8	-	-
Total		8048	97.9	135	78.9	21	12.3	1	0.6

-Continued-

Appendix Table 4. Summary of commercial recoveries of sockeye salmon tagged in British Columbia, 1944-1968 (continued).

SOUTHEAST ALASKA TAG RECOVERY AREAS									
Tagging Area		District 104		District 105		District 106		District 107	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
Haystack Island Area 3Y		2	7.4	-	-	1	3.7	-	-
Area 3	(1944)	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-
Area 3	(1945)	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-
Area 3	(1946)	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-
Area 3	(1947)	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-
Area 3	(1948)	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-
Southeastern Alaska		(1956)	-	-	-	-	-	-	-
Area 3	(1956)	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-
Area 3	(1957)	-	-	-	-	-	-	1	11.1
	4	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-
Area 3	(1958)	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-
Dixon Entrance		(1966)	-	-	-	4	11.1	1	2.8
Dundas Island		(1966)	-	-	-	-	-	1	2.8
Dixon Entrance		(1967)	-	-	-	2	14.3	-	-
Dundas Island		(1967)	-	-	-	-	-	-	-
Dixon Entrance		(1968)	-	-	-	-	-	-	-
Dundas Island		(1968)	-	-	-	-	-	2	1.8
Total		2	1.2	-	-	7	4.1	5	2.9

-Continued-

Appendix Table 4. Summary of commercial recoveries of sockeye salmon tagged in British Columbia, 1944-1968 (continued).

Tagging Area	SOUTHEAST ALASKA TAG RECOVERY AREAS		Total Number of Releases	Recovery Number And Percent of Total Releases	
	Total			Total Releases	
	Number	Percent		Number	Percent
Haystack Island Area 3Y	27	20.0	659	134	20.3
Area 3 (1944)	1	25.0	4	4	100.0
4	-	-	915	453	49.5
5	-	-	454	148	32.6
Area 3 (1945)	-	-	73	18	24.7
4	-	-	2210	787	35.6
5	-	-	523	13	2.5
Area 3 (1946)	-	-	21	3	14.3
4	-	-	2164	1131	52.3
5	-	-	233	60	25.8
Area 3 (1947)	-	-	8	3	37.5
4	-	-	2356	1223	51.9
5	-	-	400	37	9.3
Area 3 (1948)	-	-	124	15	12.1
4	-	-	2348	851	36.2
Southeastern Alaska (1956)	-	-	-	-	-
Area 3 (1956)	1	2.6	92	38	41.3
4	-	-	27	15	55.6
5	-	-	8	2	25.0
Area 3 (1957)	9	1.4	1345	665	49.4
4	1	0.9	153	109	71.2
5	-	-	36	15	41.7
Area 3 (1958)	13	5.9	388	234	60.3
4	-	-	253	155	61.3
5	-	-	120	78	65.0
Dixon Entrance (1966)	36	12.0	738	300	40.7
Dundas Island (1966)	37	4.8	1499	777	51.8
Dixon Entrance (1967)	14	3.0	1029	462	44.9
Dundas Island (1967)	4	2.5	322	159	49.4
Dixon Entrance (1968)	-	-	1	-	-
Dundas Island (1968)	28	8.4	1027	334	32.5
Total	171	2.1	19531	8223	42.1

Appendix Table 5. Number of tagged pink and sockeye salmon released in southern Southeastern Alaska and northern British Columbia, 1982.

Location	Early June		Late June		Early July	
	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon
Noyes Island	0	0	864	1,415	98	710
Dall Island	0	0	189	642	41	74
Cape Fox	8	67	37	342	3,540	484
Upper Clarence Strait	0	0	0	0	381	512
Middle Clarence Strait	0	0	0	0	474	81
Lower Clarence Strait	0	1	314	212	1,111	134
Cordova Bay	0	0	0	0	0	0
Union Bay	0	0	0	0	14	5
Alaskan Total	8	68	1,404	2,611	5,659	2,000
Langara Island	167	220	1,399	4,407	466	2,000
Dundas Island	0	0	521	1,045	676	4,357
Tracy/Boston Rocks	0	126	5	158	205	482
Stephens/Porcher Island	0	0	0	1,526	101	1,495
Birnie/Maskelyne Island	0	1,780	21	939	251	1,487
Area 5-1	0	0	0	0	0	0
Area 1	0	0	0	0	313	6
Portland Inlet	0	245	0	34	386	613
Skeena Secondary	0	0	0	5	8	687
Masset Inlet Secondary	0	0	0	0	68	5
Nass River Secondary	0	0	0	0	0	877
Kwinamass Bay Secondary	0	0	0	0	0	0
Khutzmateen Inlet Secondary	0	0	0	0	0	0
Canadian Total	167	2,371	1,946	8,114	2,474	12,012
Grand Total	175	2,439	3,350	10,725	8,133	14,012

-Continued-

Appendix Table 5. Number of tagged pink and sockeye salmon released in southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Location	Late July Pink Salmon	Sockeye Salmon	Early August Pink Salmon	Sockeye Salmon	Late August Pink Salmon	Sockeye Salmon
Noyes Island	586	473	1,893	131	13,759	84
Dall Island	716	615	2,482	109	2,329	3
Cape Fox	6,108	658	1,625	79	6,159	6
Upper Clarence Strait	1,811	1,257	3,991	404	759	0
Middle Clarence Strait	2,167	40	5,744	15	6,281	0
Lower Clarence Strait	8	6	6,137	21	5,380	8
Cordova Bay	0	0	1,234	27	4,372	2
Union Bay	587	94	639	9	0	0
Alaska Total	11,983	3,143	23,745	795	39,039	103
Langara Island	1,214	1,284	219	0	0	0
Dundas Island	2,679	4,011	4,137	677	1,857	0
Tracy/Boston Rocks	993	295	1,405	12	2,660	0
Stephens/Porcher Is.	1,263	2,269	5,741	347	23	0
Birnie/Maskelyne Is.	1,279	417	2,286	147	7,050	77
Area 5-1	148	55	5,546	435	3,237	0
Area 1	3,881	13	6,071	0	2,222	28
Portland Inlet	4,101	456	221	0	180	0
Skeena River Secondary	120	1,581	119	10	1,669	78
Masset Inlet Secondary	146	4	0	0	0	0
Nass River Secondary	0	2,172	0	0	0	0
Kwinamass Secondary	1,662	0	1,484	0	0	0
Khutzmateen Inlet Secondary	93	0	108	0	384	0
Canadian Total	17,718	15,700	27,337	1,628	19,282	183
Grand Total	29,701	18,843	51,082	2,423	58,321	286

-Continued-

Appendix Table 5. Number of tagged pink and sockeye salmon released in southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Location	Early September		Late September		Total	
	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon
Noyes Island	0	0	0	0	17,200	2,813
Dall Island	0	0	0	0	5,757	1,433
Cape Fox	0	0	0	0	17,477	1,636
Upper Clarence Strait	0	0	0	0	6,942	2,173
Middle Clarence Strait	0	0	0	0	14,666	136
Lower Clarence Strait	0	0	0	0	12,950	382
Cordova Bay	0	0	0	0	5,606	29
Union Bay	0	0	0	0	1,240	108
Alaskan Total	0	0	0	0	81,838	8,720
Langara Island	0	0	0	0	3,465	7,909
Dundas Island	2,879	0	0	0	12,749	10,090
Tracy/Boston Rocks	342	0	0	0	5,610	1,073
Stephens/Porcher Is.	0	0	0	0	7,128	5,637
Birnie/Maskelyne Is.	1,127	0	0	0	12,014	4,847
Area 5-1	542	0	0	0	9,473	490
Area 1	0	0	0	0	12,487	47
Portland Inlet	36	0	0	0	4,924	1,348
Skeena River Secondary	154	15	0	0	2,070	2,376
Masset Inlet Secondary	0	0	0	0	214	9
Nass River Secondary	0	0	0	0	0	3,049
Kwinamass Bay Secondary	0	0	0	0	3,146	0
Khutzmateen Inlet Secondary	2	0	0	0	587	0
Canadian Total	5,082	15	0	0	73,867	36,875
Grand Total	5,082	15	0	0	155,705	45,593

Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982.

Stream Name	Stream Number	Number of Surveys	In-stream Estimated Peak Escapement Pink Salmon	Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Percent Canada	Number and Percent of Sockeye Tags Recovered Alaska	Percent Canada
Harry Bay	101-11-14	2	18,793	0	23	109	0	0
Nakat Creek	101-11-37	1	20,440	0	29	72	0	0
Sockeye Creek	101-11-39	1	8,970	0	29	87	0	0
Willard Creek	101-11-65	2	6,915	0	4	12	0	0
Longwalk Creek	101-11-74	3	14,547	0	16	99	0	0
Canine Creek	101-11-75	2	654	0	2	2	0	0
Fillmore Inlet								
Northwest Head	101-11-78	2	4,813	0	2	16	0	0
Fillmore Creek	101-11-79	3	24,389	5	17	89	0	0
Hoffman Creek	101-11-80	1	14	147	0	0	0	0
Rubble Creek	101-11-84	2	1	0	0	0	0	0
Cannery Creek	101-11-99	2	2,046	0	7	33	0	0
Hidden Inlet	101-11-101	2	6,470	0	2	3	0	0
Tombstone River	101-15-19	2	22,479	2	11	84	0	0
Fish Creek (Hyder)	101-15-85	1	665	(3573 chums)	1	5	0	(2 chums)
Very Inlet,								
North Head	101-23-19	2	32,351	3	96	47	0	0
Very Inlet,								
Southeast Head	101-23-27	2	9,350	-	31	29	0	0
Tamgas Creek Hatchery								
Annette Island	101-25-25	-	-	-	4	0	0	0
Hemlock Creek Weir								
Annette Island	101-27-09	-	-	-	4	2	0	0
Dall Head Creek	101-27-19	2	414	0	14	2	0	0
Bostwick Bay								
Southwest Side	101-27-26	2	816	0	7	2	0	0
Bostwick Bay								
Southwest Side	101-27-28	2	1,060	0	9	1	0	0

-Continued-

Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Estimated Peak Escapement Pink Salmon	Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Percent of Sockeye Tags Recovered Canada	Number and Percent of Sockeye Tags Recovered Alaska	Percent of Sockeye Tags Recovered Canada
Bostwick Creek	101-27-36	1	2,460	0	2	0	0	0
Vallenar Creek	101-29-06	2	14,316	0	61	6	0	0
Weasel Cove	101-30-09	2	5,120	0	30	10	0	0
Badger Bay	101-30-12	1	-	-	1	1	0	0
Keta River	101-30-30	2	11,492	7	5	1	0	0
Marten River	101-30-60	2	17,684	6	13	4	0	0
Humpback Creek	101-30-83	2	83,680	7	151	102	0	0
Mink Bay Head	101-30-89	2	2,006	0	1	2	0	0
Vixen Bay Head	101-30-95	2	6,540	0	11	11	0	0
Lucky Cove	101-41-02	1	3,754	0	11	10	0	0
Nadzaheen Creek	101-41-67	1	21,003	0	72	23	0	0
Northwest of Mink Island	101-43-25	1	24	0	0	0	0	0
Mop Creek	101-43-26	1	820	0	2	0	0	0
Pop Creek	101-43-29	1	3	0	0	0	0	0
Fish Creek	101-43-33	1	405	0	0	0	0	0
White River	101-45-24	2	17,647	5	19	1	0	0
Bull Creek	101-45-30	2	0	0	0	0	0	0
Leash Creek	101-45-32	1	1,042	0	0	0	0	0
Coon Creek	101-45-46	2	326	0	1	0	0	0
Carrol Creek	101-45-78	1	-	-	9	2	0	0
Spit Creek	101-45-94	1	5,770	0	9	3	0	0
Ward Creek	101-47-15	2	3,277	290	3	1	0	0
Ketchikan Creek	101-47-25	2	342	0	8	0	0	0
Cabin Creek	101-55-09	2	17,056	13	27	8	0	0
Wilson River	101-55-20	2	39,428	10	10	2	0	0
Blossom River	101-55-40	2	128,376	0	4	0	0	0
Bakewell Creek	101-55-60	2	9,276	9	4	2	0	0
Bakewell Right Head	101-55-65	1	421	0	3	1	0	0

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Estimated Peak Escapement Pink Salmon	Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Percent Canada	Number and Percent of Sockeye Tags Recovered Alaska	Percent Canada
Skull Creek	101-55-87	2	13,189	1	15	13	0	0
Carp Creek	101-55-95	2	189	0	0	0	0	0
Nooya Creek	101-60-09	2	21,520	0	4	1	0	0
Nudyard Creek	101-60-15	2	9,694	0	5	1	0	0
Sandpiper Creek	101-60-20	1	10,285	0	8	0	0	0
Valentine Creek	101-60-25	2	4,307	0	3	2	0	0
Big Goat Creek	101-60-30	2	56,082	1	6	7	0	0
Humpy Creek	101-71-08	2	31,934	3	16	9	0	0
King Creek	101-71-14	2	34,498	2	14	6	0	0
Choca Creek	101-71-16	2	12,000	1	9	2	0	0
Walker Cove Left Head	101-71-25	1	146	0	0	1	0	0
Walker Cove Right Head	101-71-26	1	45	0	0	0	0	0
Walker Creek	101-71-28	1	7,961	0	7	1	0	0
Portage Creek	101-71-63	2	15,764	0	5	1	0	0
Herman Creek	101-75-05	2	23,685	2	16	3	0	0
Grant Creek	101-75-10	1	1,850	0	2	0	0	0
Eulachon River	101-75-15	2	27,174	3	3	1	0	0
Genes Lake Creek	101-75-17	1	0	314	1	0	0	0
Klahini River	101-75-50	2	14,857	2	1	0	0	0
Saks Creek	101-75-76	2	16,851	0	2	1	0	0
Indian Creek	101-75-85	1	277	0	0	0	0	0
Cow Creek	101-80-03	2	29,740	4	64	5	0	0
Wasta Creek	101-80-40	1	1,486	101	4	0	0	0
Spacious Bay	101-80-50	2	12,205	0	26	5	0	0
Sea Lion Cove Creek	101-80-60	2	5,640	2	24	2	0	0
Short Creek	101-80-84	2	16,371	0	32	4	0	0
Traitors Cove Creek	101-90-29	2	74,900	0	40	7	0	0

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Estimated Peak Pink Salmon	Escapement Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Percent of Sockeye Tags Recovered Canada	Number and Percent of Sockeye Tags Recovered Alaska	Percent of Sockeye Tags Recovered Canada
Marguerite Creek	101-90-39	2	14,536	10	45	3	0	0
Naha River	101-90-50	3	46,640	5,738	99	11	27	2
Wolf Creek	101-90-60	3	2,675	0	8	1	0	0
Moser Bay Creek	101-90-61	3	17,531	4	45	6	0	0
Moser Bay Right Head	101-90-62	3	2,303	0	9	3	0	0
Lottery Creek	101-90-64	3	258	0	0	0	0	0
Lunch Creek	101-90-68	3	4,084	0	14	6	0	0
Bond Bay South	101-90-71	2	11,194	0	77	5	0	0
Bond Bay North	101-90-72	2	5,353	0	30	2	0	0
Smugglers Cove Creek	101-90-75	2	556	0	1	0	0	0
Falls Creek	101-90-76	1	67	0	0	0	0	0
Helm Bay Head Creek	101-90-80	2	33,000	3	102	7	0	0
Helm Bay Lake Creek	101-90-84	1	0	0	0	0	1	0
Granite Creek	101-90-86	2	10,212	0	27	4	0	0
Stewart Creek #3	101-90-91	1	4	0	0	0	0	0
Port Stewart Creek	101-90-92	2	21,321	0	34	4	0	0
District 101 Total	92 Streams	163	1,179,821	6,680	1,563 (60.8%)	1,008 (39.2%)	28 (92.3%)	2 (6.7%)
Nichols Lake Creek	102-10-60	2	2,606	0	13	5	0	0
Johnson Cove								
East Side	102-30-15	1	0	0	0	0	0	0
Johnson Cove Creek	102-30-17	2	18,717	1	27	0	0	0
Perkins Creek	102-30-28	2	6,905	0	17	2	0	0
Moir Sound								
Southeast Head	102-30-35	2	1,859	0	7	-	0	0
Moir Sound								
South Arm South Head	102-30-37	1	3,219	0	0	1	0	0

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Estimated Peak Escapement Pink Salmon	Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Percent Canada	Number and Percent of Sockeye Tags Recovered Alaska	Percent Canada
Moria Sound South Arm Head	102-30-40	2	3,053	0	0	0	0	0
Moria Sound West Head	102-30-42	2	5,219	14	4	10	0	0
Moria Sound Head West Arm	102-30-47	2	172	0	1	0	0	0
Frederick Cove North	102-30-49	1	0	0	0	0	0	0
Frederick Creek	102-30-51	2	9,560	2	13	3	0	0
Kugel Creek	102-30-65	2	1,592	0	4	1	0	0
Kegan Creek	102-30-67	1	0	0	0	1	0	0
Kitkun Bay Head	102-40-22	1	0	0	0	0	0	0
Disappearance Creek	102-40-43	1	304	0	0	0	0	0
South Arm Cholmondeley Sound Head	102-40-45	1	639	0	1	0	0	0
Cannery Creek	102-40-52	2	1,770	0	2	0	0	0
Lagoon Creek	102-40-60	1	12,940	1	64	5	0	0
Cholmondeley Sound Head	102-40-69	1	0	0	0	0	0	0
Sunny Creek	102-40-87	2	31,200	22	122	14	0	0
Old Tom Creek	102-60-24	2	13,379	12	118	5	0	0
Dog Salmon Creek	102-60-38	1	1,473	10	0	0	0	0
Polk Creek	102-60-40	1	100	-	0	0	0	0
Kina Creek	102-60-68	2	16,290	-	106	11	0	0
Twelve Mile Creek	102-60-72	2	9,940	1	46	6	0	0
Indian Creek	102-60-80	2	17,104	-	15	5	0	0
Harris River	102-60-82	3	15,265	7	26	1	0	0
Maybeso Creek	102-60-84	2	1,655	2	4	0	0	0
Thorne River	102-70-58	2	66,017	10	290	32	0	0
District 102 Total	29 Streams	48	222,978	82	880 (89.6%)	102 (10.4%)	0 (0.0%)	0 (0.0%)

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Estimated Peak Escapement		Number and Percent of Tags Recovered		Number and Percent of Sockeye Tags Recovered	
			Pink Salmon	Sockeye Salmon	Alaska	Canada	Alaska	Canada
Buscuit Lagoon Left	103-11-13	2	1,965	-	14	0	0	0
Hunter Bay East Head	103-11-17	1	22,760	-	52	3	0	0
Hessa Inlet Creek	103-11-25	2	2,967	-	7	1	0	0
Hessa Inlet Creek	103-11-27	1	1	-	0			
Little Daykoo Bay Head	103-11-35	1	2,164	-	12	3	0	0
Datzkoo Harbor Head	103-11-41	1	398	-	2	0	0	0
Klakas Right Head	103-15-23	1	32,223	1	175	5	0	0
Klakas Lake	103-15-27	2	0	3,827	0	0	4	0
Natkwa Creek	103-21-08	1	11,271	-	24	4	0	0
Elbow Creek	103-21-42	1	1	-	0	0	0	0
Saltery Creek	103-25-05	1	16,225	-	43	0	0	0
Den Creek	103-25-15	1	17,878	-	97	5	0	0
Hetta Portage Creek	103-25-30	1	29,400	3	79	3	0	0
Coppermount Harbor	103-25-41	1	2,862	-	4	1	0	0
Hetta Lake Creek	103-25-47	1	2,882	-	10	0	0	0
Soda Bay Northwest Side Right	103-40-03	1	7,765	-	6	0	0	0
Soda Bay	103-40-07	1	0	-	0	0	0	0
Shelifof Creek	103-40-09	1	1,340	-	1	0	0	0
Soda Bay Right Head	103-40-17	1	10	-	0	0	0	0
Flat Creek	103-40-30	1	2,637	-	13	0	0	0
Natzuhini Northeast Side	103-40-35	1	4,658	-	7	0	0	0
Natzuhini Bay	103-40-39	1	465	-	0	0	0	0
Hydaburg River	103-40-41	1	9,127	-	17	2	0	0
North of Reese Point Creek	103-40-64	1	1,141	-	3	0	0	0
South View Cove	103-40-71	1	8	-	0	0	0	0
Port Estrella Head	103-50-21	2	9,549	2	7	0	0	0
Port Estrella Right Head	103-50-22	2	2,059	-	1	0	0	0
Waterfall Creek South	103-50-29	2	14,350	-	23	1	0	0

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Estimated Peak Escapement Pink Salmon	Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Canada	Number and Percent of Sockeye Tags Recovered Alaska	Canada
Ulloa Bay West	103-50-31	1	50	-	0	0	0	0
East of Waterfall Creek	103-50-32	2	2,820	-	6	0	0	0
West of Waterfall Creek	103-50-34	2	13,857	-	6	0	0	0
Port Refugio West Arm Right	103-50-44	2	1,360	-	8	0	0	0
Port Refugio West Arm Head	103-50-49	2	11,255	3	17	0	0	0
Shinaku Inlet	103-60-09	2	1,025	-	1	0	0	0
Shinaku Inlet	103-60-11	1	740	-	0	0	0	0
Shinaku Creek	103-60-13	2	10,830	-	7	0	0	0
Steelhead Creek	103-60-29	2	10,550	-	0	0	0	0
Blackbear Creek	103-60-31	2	3,696	-	1	0	0	0
Dog Salmon Creek	103-60-35	2	290	-	0	0	0	0
Big Salt Lake	103-60-39	2	576	-	1	0	0	0
Airport Creek/Klawock	103-60-43	2	115	-	0	0	0	0
Trevor Creek	103-60-45	2	2,166	-	0	0	0	0
St. Nicholas North Side	103-60-57	2	2,183	-	0	0	0	0
Port Nicholas Head	103-60-59	2	22,500	-	30	0	0	0
Doyle Creek	103-60-65	2	5,159	-	0	0	0	0
Trocadero Bay Northwest Side	103-60-71	1	178	-	0	0	0	0
Trocadero Bay North Side	103-60-73	2	2,226	-	0	0	0	0
Trocadero Bay Left Head	103-60-75	2	17,290	-	18	0	0	0
Trocadero Bay Head Right Side	103-60-77	2	21,700	-	27	0	0	0
Trocadero Bay South Side	103-60-79	2	548	-	0	0	0	0

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Estimated Peak Escapement Pink Salmon	Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Percent Canada	Number and Percent of Sockeye Tags Recovered Alaska	Percent Canada
Deep Bay	103-60-87	2	6,710	-	5	0	0	0
Perlas Point Creek	103-60-89	2	1,272	-	1	0	0	0
East of Caldera	103-60-90	2	2,165	-	1	0	0	0
Port Caldera	103-60-92	1	5,582	-	10	0	0	0
Left Fork West of Caldera	103-60-93	2	1,304	-	0	0	0	0
2 Miles North								
Blanquizar Point	103-70-03	1	400	-	0	0	0	0
James Creek	103-70-05	2	10,153	-	2	0	0	0
Goodrow Creek	103-70-08	2	9,210	-	2	0	0	0
11 Mile Creek	103-70-11	2	17,510	-	3	0	0	0
Cruz Cove Head Stream	103-70-15	2	8,277	-	9	0	0	0
Warm Chuck West Head								
Right Side	103-80-24	1	1,760	-	0	0	0	0
Warm Chuck Left Head								
Right Side	103-80-26	1	8,500	-	4	0	0	0
Warm Chuck								
Northwest Head	103-80-29	1	760	-	0	0	0	0
Nossuk Bay Left Head	103-80-35	1	19,680	15	1	0	0	0
Salt Lake Bay								
North Head	103-80-42	2	360	-	0	0	0	0
Salt Lake Bay Head	103-80-44	2	2,592	-	0	0	0	0
Salt Lake Bay								
Right Head	103-80-46	2	6,518	-	1	0	0	0
South of Salt								
Lake Bay	103-80-50	2	19,204	-	2	0	0	0
North Inside of St.								
Phillips Island	103-80-53	1	487	-	0	0	0	0
Inside of St.								
Phillips Island	103-80-56	1	1,069	-	0	0	0	0
Sarheen Creek	103-90-04	2	7,365	-	1	0	0	0
El Capitan East Side	103-90-06	2	10,025	-	1	0	0	0

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Estimated Peak Escapement Pink Salmon	Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Canada	Number and Percent of Sockeye Tags Recovered Alaska	Canada
Yatuk Creek	103-90-25	2	16,200	70	0	0	0	0
Naukati Creek	103-90-26	2	3,518	-	0	0	0	0
Gutchie Creek	103-90-27	2	16,153	-	1	0	0	0
Slow Creek	103-90-28	2	7,700	-	0	0	0	0
Staney Creek	103-90-30	2	82,890	-	4	0	0	0
Tuxekan Pass #35	103-90-35	2	2,770	-	0	0	0	0
Tuxekan Pass	103-90-39	1	818	-	0	0	0	0
Shaheen Creek	103-90-42	1	13,530	-	1	0	0	0
Charley Creek	103-90-58	1	29,070	-	3	0	0	0
Token Bay Head	103-90-69	1	22,590	25	2	0	0	0
Token Bay Right Head	103-90-71	1	630	-	0	0	0	0
Token Camp	103-90-72	1	34,701	-	3	0	0	0
El Capitan West Side	103-90-79	2	1,318	-	0	0	0	0
Devilfish Bay Head	103-90-80	2	10,320	2	0	0	0	0
Devilfish Bay Southwest Side	103-90-81	2	4,972	-	0	0	0	0
District 103 Total	87 Streams	139	689,778	3,949	791 (96.8%)	26 (3.2%)	4 (100.0%)	0 (0.0%)
Bar Creek	104-20-15	1	2	-	0	0	0	0
Sakie Bay	104-20-20	1	278	-	5	0	0	0
Diver Bay Left Side	104-30-40	1	137	-	0	0	0	0
Diver Bay Right Side	104-30-45	1	96	-	0	0	0	0
District 104 Total	4 Streams	4	513	0	5	0	0	0

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Estimated Peak Escapement		Number and Percent of Pink Tags Recovered		Number and Percent of Sockeye Tags Recovered	
			Pink Salmon	Sockeye Salmon	Alaska	Canada	Alaska	Canada
Kathleen Creek	105-10-19	1	8,857	-	1	0	0	0
Joan Creek	105-10-21	1	4,801	-	0	0	0	0
Bear Harbor Creek	105-10-24	1	73,600	-	0	1	0	0
Kell Slough Creek	105-10-28	1	900	-	0	0	0	0
Kell Bay Creek	105-10-32	1	8,310	-	0	0	0	0
Kim Creek	105-20-02	1	2,423	-	0	0	0	0
Paul Creek	105-20-04	1	4,415	-	2	0	0	0
Port Beauclerc								
Northwest Head	105-20-05	1	1,886	-	0	0	0	0
	105-31-02	1	0	-	0	0	0	0
Kushneahin Creek	105-31-03	1	303	-	0	0	0	0
Northeast of Skiff Island	105-31-07	1	0	-	0	0	0	0
No Name Bay								
North Side	105-31-10	1	31	-	0	0	0	0
No Name Bay Creek	105-31-12	1	0	-	0	0	0	0
1st Stream								
No Name Bay	105-31-14	1	0	-	0	0	0	0
3rd Stream North of								
No Name Bay	105-31-18	1	23	-	0	0	0	0
Alvin Bay North Side	105-31-19	1	34	-	0	0	0	0
Alvin Bay Head	105-31-20	1	340	-	0	0	0	0
Reid Bay North								
Arm West	105-31-26	1	44	-	0	0	0	0
Reid Bay West Side	105-31-27	1	1,684	-	0	0	0	0
Reid Bay Southwest								
Arm Head	105-31-29	1	43	-	0	0	0	0
Lovelace Creek	105-32-01	1	565	-	0	0	0	0
Tunehean Creek	105-32-04	1	81	-	0	0	0	0

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Estimated Peak Escapement Pink Salmon	Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Percent Canada	Number and Percent of Sockeye Tags Recovered Alaska	Percent Canada
3 Mile Arm North Arm Head	105-32-69	1	185	-	0	0	0	0
3 Mile Arm Northwest Arm Head	105-32-73	1	100	-	0	0	0	0
Seculusion Harbor North	105-32-80	1	35	-	0	0	0	0
Seculusion Harbor Head	105-32-82	1	2,020	-	0	0	0	0
Hole in the Wall Northeast	105-41-03	1	14	-	0	0	0	0
Hole in the Wall Southeast	105-41-05	1	4,290	-	0	0	0	0
Calder Creek	105-42-05	1	23,540	-	1	0	0	0
El Capitan Creek	105-42-09	1	10,554	-	0	0	0	0
Wolf Creek - El Capitan	105-42-10	1	2,000	-	0	0	0	0
El Capitan - Anskett	105-42-11	1	7,250	-	1	0	0	0
El Capitan Dry Pass	105-42-12	1	3,320	-	0	0	0	0
Shipley Lake Creek	105-43-02	1	10,700	-	1	0	0	0
Shipley Bay South Side	105-43-06	1	13,700	-	3	0	0	0
Trout Creek	105-50-01	1	3,946	-	2	0	0	0
District 105 Total	36 Streams	36	189,954	0	11 (91.7%)	1 (8.3%)	0 (0.0%)	0 (0.0%)
Ratz Harbor Creek	106-10-10	3	28,200	29	70	2	0	1
Eagle Creek	106-10-30	5	81,128	902	1 93	18	7	0
McHenry Anchorage	106-20-23	1	188	-	1	0	0	0

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Estimated Peak Escapement Pink Salmon	Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Percent Canada	Number and Percent of Sockeye Tags Recovered Alaska	Percent Canada
Hatchery Creek	106-21-03	1	1,029	-	4	0	0	0
Falls Creek	106-21-04	5	8,106	-	39	4	0	0
Trout Creek	106-21-05	4	8,290	2	53	1	0	0
Mosman Inlet								
Northwest Head	106-22-04	1	893	-	2	0	0	0
Flat Creek	106-22-06	2	22,985	1	70	5	0	0
Mosman Creek								
East Head	106-22-08	2	9,525	-	92	8	0	0
Mosman Creek								
Southeast Head	106-22-10	2	469	-	4	0	0	0
Burnett Inlet								
Northeast Head	106-22-14	2	145	-	1	0	0	0
Navy Creek	106-22-16	4	10,506	-	0	0	0	0
Porcupine Creek	106-30-10	1	20,124	-	87	6	0	0
Chum Creek	106-30-12	1	482	-	1	0	0	0
Coffman Cove Creek	106-30-15	1	208	-	0	0	0	0
Mabel Creek	106-30-72	1	1,126	-	2	0	0	0
West of Mabel Creek	106-30-73	1	0	-	0	0	0	0
Rocky Bay	106-30-74	1	803	-	1	0	0	0
Neck Lake Creek	106-30-75	1	88	-	0	0	0	0
Whale Pass West Head	106-30-77	1	153	-	0	0	0	0
108 Creek	106-30-80	1	3	-	0	0	0	0
Squaw Creek	106-30-82	1	2,065	-	3	0	0	0
Exchange Cove	106-30-85	2	560	-	0	0	0	0
Salmon Bay Creek	106-41-10	1	980	-	0	0	0	0
Salmon Lake	106-41-12	1	0	4,610	0	0	0	0
Big Creek - Red Bay	106-41-33	1	0	2,835	0	0	0	0

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Estimated Peak Escapement Pink Salmon	Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Percent Canada	Number and Percent of Sockeye Tags Recovered Alaska	Percent Canada
Totem Creek	106-41-55	1	614	-	0	0	0	0
Douglas Bay Creek	106-41-65	1	0	-	0	0	0	0
Douglas Bay Mid Arm	106-41-70	1	0	0	0	0	0	0
Douglas Bay Northeast Arm	106-41-75	1	0	0	0	0	0	0
Kah Sheets Creek	106-42-10	1	-	478	0	0	0	0
Twin Creek	106-44-04	2	401	-	0	0	0	0
Falls Creek	106-44-06	2	1,537	-	0	0	0	0
	106-44-50	1	4	-	0	0	0	0
Stags Creek	106-44-55	1	550	-	0	0	0	0
Petersburg Creek	106-44-60	1	7,546	-	0	0	0	0
District 106 Total	36 Streams	59	208,710	8,852	623 (93.3%)	44 (6.7%)	7 (87.5%)	1 (0.0%)
Emerald Creek	107-10-10	1	10,775	-	113	12	0	0
Vixen Inlet Creek	107-10-20	2	225	-	4	0	0	0
Cannery Creek	107-10-27	1	1,152	-	9	0	0	0
Blackbear Creek	107-10-30	3	63,730	13	559	25	0	0
Kudays Creek	107-10-70	3	3,791	-	2	0	0	0
Chum Creek	107-10-71	3	300	-	0	0	0	0
South Etolin Island East	107-10-72	2	310	-	0	0	0	0
Anan Creek	107-20-01	3	113,681	4	76	6	0	0
Santa Anna Creek	107-20-10	1	3	-	0	0	0	0
	107-20-18	1	100	-	0	0	0	0
Canoe Pass West Side	107-20-20	3	1,790	-	3	0	0	0
Fisherman's Chuck	107-20-23	3	1,130	-	5	1	0	0
Menefee Creek	107-20-30	2	16,548	-	28	4	0	0
Menefee Southwest	107-20-31	1	2,560	-	0	0	0	0
Fools Inlet Creek	107-20-70	3	23,262	2	75	9	0	0

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Estimated Peak Escapement Pink Salmon	Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Canada	Number and Percent of Sockeye Tags Recovered Alaska	Canada
Thoms Creek	107-30-30	1	0	3,438	0	0	6	0
Snake Creek	107-30-70	1	7,718	-	17	0	0	0
Brad Creek	107-30-80	1	44	-	1	0	0	0
Dog Salmon Creek	107-30-90	1	1,798	-	6	0	0	0
Crittenden Creek	107-40-05	1	4,582	-	11	0	0	0
East Crittenden Creek	107-40-06	1	1,930	-	3	0	0	0
Marton Creek	107-40-38	2	15,460	5	35	3	0	0
Franks Creek	107-40-40	2	12,015	-	51	2	0	0
Schonberg Slough	107-40-45	1	0	-	0	0	0	0
Tom Lake Creek	107-40-47	2	9,595	33	4	0	0	0
Eagle River	107-40-55	1	50,030	-	7	0	0	0
District 107 Total	28 Streams	48	342,618	3,495	1,009 (94.2%)	62 (5.84%)	6 (100.04%)	0 (0.0%)
Ohmer Creek	108-40-40	1	0	-	0	0	0	0
Bear Creek	108-40-50	1	962	-	0	0	0	0
	108-50-03	1	11,600	-	0	0	0	0
	108-50-04	1	0	-	0	0	0	0
	108-50-05	1	776	-	0	0	0	0
Five Mile Creek	108-60-06	1	4,357	-	1	0	0	0
District 108 Total	8 Streams	8	26,326	0	3 (75.0%)	1 (25.0%)	0 (0.0%)	0 (0.0%)
Sashin Creek Weir	109-10-06	-	-	-	1	2	0	0
Woewodski Creek	109-30-01	1	593	-	0	0	0	0
	109-30-05	1	0	-	0	0	0	0
Eliza Bay West Creek	109-30-06	1	0	-	0	0	0	0

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Estimated Peak Escapement Pink Salmon	Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Percent of Recovered Canada	Number and Percent of Sockeye Tags Recovered Alaska	Percent of Recovered Canada
Herring Bay East	103-30-10	1	8	-	0	0	0	0
Herring Bay Middle	103-30-11	1	0	-	0	0	0	0
Elena Bay Northwest Side	109-62-10	1	1,681	-	0	0	0	0
Elena Bay Northwest Head	109-62-11	1	2,375	-	0	0	0	0
Elena Bay Head	109-62-12	1	1,746	-	0	0	0	0
Alecks Creek	109-62-13	1	32,802	-	0	0	0	0
Sample Creek	109-62-14	1	7,590	-	1	0	0	0
West of Long Island	109-62-17	1	9,120	-	0	1	0	0
Goose Trap Creek	109-62-18	1	10,755	-	1	0	0	0
Petrof Bay Southwest	109-62-20	1	5,170	-	0	0	0	0
Petrof Bay Southwest	109-62-26	1	4,507	-	0	0	0	0
William Creek	109-62-28	1	6,210	-	0	0	0	0
Salt Chuck Creek	109-62-31	1	1,806	-	0	0	0	0
District 109 Total	17 Streams	16	84,363	0	3 (50.0%)	3 (50.0%)	0 (0.0%)	0 (0.0%)
	110-13-01	1	0	-	0	0	0	0
	110-13-1A	1	0	-	0	0	0	0
Todahl Creek	110-13-06	1	1,852	-	0	0	0	0
Dale Creek	110-14-08	1	1,719	-	0	0	0	0
No Name Creek	110-15-02	1	0	-	0	0	0	0
Cat Creek	110-15-03	1	13,067	-	0	0	0	0
Old Man Creek	110-22-02	2	6,872	-	0	0	0	0
Amber Creek	110-22-04	2	1,863	-	0	0	0	0
	110-22-06	1	2,115	-	0	0	0	0

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Peak Pink Salmon	Estimated Escapement Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Percent Canada	Number and Percent of Sockeye Tags Recovered Alaska	Percent Canada
Beautiful Creek	110-22-09	1	1,530	-	0	0	0	0
Donkey Creek	110-22-12	2	2,822	-	0	0	0	0
Cannery Creek	110-22-14	2	1,820	-	1	0	0	0
Last Chance	110-23-04	1	2,180	-	0	0	0	0
	110-23-05	1	293	-	0	0	0	0
Johnston Creek	110-23-08	1	30,930	-	0	0	0	0
Bowman Creek	110-23-10	2	7,468	-	0	0	0	0
Snug Creek	110-23-19	1	931	-	0	0	0	0
Libby Creek	110-31-02	1	467	-	0	0	0	0
Roberts Island	110-31-04	1	3,480	-	0	0	0	0
Goat Creek	110-32-02	1	89	-	0	0	0	0
Tunnel Creek	110-32-07	2	4,538	-	0	0	0	0
Chuck River	110-32-09	2	114,312	-	0	0	0	0
Surprise Creek	110-32-14	2	1,665	-	1	1	0	0
Nancy Creek	110-33-08	1	4,250	-	1	0	0	0
Laura Creek	110-33-13	2	43,500	-	2	0	0	0
	110-34-01	1	708	-	0	0	0	0
	110-34-02	1	1,100	-	0	0	0	0
Dry Bay	110-34-04	2	4,840	-	0	0	0	0
Glenn Creek	110-34-06	1	9,922	-	0	0	0	0
Sandborn Creek	110-34-08	2	59,100	-	1	0	0	0
	110-34-10	1	124	-	0	0	0	0
	110-34-11	1	-	-	0	0	0	0
Placer Creek	110-34-12	1	717	-	0	0	0	0
Haystack Creek	110-34-13	1	625	-	0	0	0	0
Negro Creek	110-34-14	3	7,542	-	0	0	0	0
District 110 Total	35 Streams	48	332,441	0	6 (85.7%)	1 (14.3%)	0 (0.0%)	0 (0.0%)

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Peak Escapement Pink Salmon	Estimated Escapement Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Number and Percent of Sockeye Tags Recovered Canada	Number and Percent of Sockeye Tags Recovered Alaska	Number and Percent of Sockeye Tags Recovered Canada
East River	182-20-10	-	-	-	0	0	1	0
Lost River	182-20-10	-	-	-	0	0	1	0
Yakutat Bay	183-20-10	-	-	-	0	0	1	0
District 182 Total	3 Streams	-	-	-	0 (0.0%)	0 (0.0%)	3 (100%)	0 (0.0%)
Alaskan Total	375 Streams	569	3,284,835	15,618	4,894 (79.9%)	1,248 (21.1%)	48 (94%)	3 (6%)
Area 1	None	2	N/A	N/A	3	49	0	0
Area 1 Total		2	N/A	N/A	3 (6.0%)	49 (94%)	0 (0.0%)	0 (0.0%)
Lakelse	Skeena River	18	N/A	N/A	11	151	1	25
Kitwanga	Skeena River	1	N/A	N/A	0	1	0	0
Above Babine	Skeena River	6	N/A	N/A	0	0	0	17
Allistair	Skeena River	1	N/A	N/A	0	0	0	12
Skeena River Total		28	N/A	N/A	14 (6.5%)	201 (93.5%)	1 (1.8%)	54 (98.2%)

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Peak Escapement Pink Salmon	Estimated Escapement Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Number and Percent of Sockeye Tags Recovered Canada	Number and Percent of Sockeye Tags Recovered Alaska	Number and Percent of Sockeye Tags Recovered Canada
Damochax	Nass River	1	N/A	N/A	0	0	0	1
Fred Wright	Nass River	6	N/A	N/A	0	0	1	15
Bowser	Nass River	2	N/A	N/A	0	0	0	0
Nass River Total		9	N/A	N/A	0	0	1 (5.3%)	18 (94.7%)
Kwinomass River	Portland Inlet	4	N/A	N/A	13	227	0	0
Kwinomass Total		4	N/A	N/A	13 (5.4%)	227 (94.69%)	0	0
Khutzmateen River	Portland Inlet	2	N/A	N/A	4	31	0	0
Khutzmateen Total		2	N/A	N/A	4 (11.4%)	31 (88.6%)	0	0
Yakoun River	Masset Inlet (Graham Island)	3	N/A	N/A	2	7	0	0
Masset Inlet Total		3	N/A	N/A	2 (22.2%)	7 (77.8%)	0	0
Quaal River	Area 6 (Douglas Channel)	1	N/A	N/A	0	1	0	0
Kemano River	Area 6 (Douglas Channel)	3	N/A	N/A	0	8	0	0
(100%)								

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Appendix Table 6. U.S./Canada research in-stream tag recovery data from southern Southeastern Alaska and northern British Columbia, 1982 (continued).

Stream Name	Stream Number	Number of Surveys	In-stream Estimated Peak Escapement Pink Salmon	Estimated Sockeye Salmon	Number and Percent of Pink Tags Recovered Alaska	Percent of Sockeye Tags Recovered Canada	Number and Percent of Sockeye Tags Recovered Alaska	Percent of Sockeye Tags Recovered Canada
Dog Fish River	Area 3 (Portland Inlet)	1	N/A	N/A	0	8	0	0
Area 3 Total		1	N/A	N/A	0	8 (100%)	0	0
Moore River	Area 5	1	N/A	N/A	0	5	0	0
Kasiks River	Area 5	2	N/A	N/A	0	2	1	0
		3	N/A	N/A	0	7 (100%)	1 (100%)	0
Canadian Total		53	N/A	N/A	33 (6.3%)	490 (92.7%)	3 (4.0%)	72 (96.0%)

Appendix Table 7. U.S./Canada salmon interception research percent contribution calculation example, 1982.

1982 Sockeye	Recoveries From (code	103 103)			
Lower Clarence Releases	Period	Recovered	Released	Proportion	Contribution (%)
	Other	0	0	.0000	.0
	Early June	0	1	.0000	.0
	Late June	3	212	.0142	2.2
	Early July	0	134	.0000	.0
	Late July	0	6	.0000	.0
	Early Aug	0	21	.0000	.0
	Late Aug	0	8	.0000	.0
	Early Sept	0	0	.0000	.0
	Late Sept	0	0	.0000	.0
	Total	3	382		
Cordova Bay Releases	Period	Recovered	Released	Proportion	Contribution (%)
	Other	0	0	.0000	.0
	Early June	0	0	.0000	.0
	Late June	0	0	.0000	.0
	Early July	0	0	.0000	.0
	Late July	0	0	.0000	.0
	Early Aug	0	27	.0000	.0
	Late Aug	1	2	.5000	77.1
	Early Sept	0	0	.0000	.0
	Late Sept	0	0	.0000	.0
	Total	1	29		
Langara Releases	Period	Recovered	Released	Proportion	Contribution (%)
	Other	0	0	.0000	.0
	Early June	0	220	.0000	.0
	Late June	8	4407	.0018	.3
	Early July	4	2000	.0020	.3
	Late July	1	1284	.0008	.1
	Early Aug	0	0	.0000	.0
	Late Aug	0	0	.0000	.0
	Early Sept	0	0	.0000	.0
	Late Sept	0	0	.0000	.0
	Total	13	7911		

Notes: (1) Proportion is the number recovered in the specified area divided by the number released in the specified time and area.
 (2) Contribution percentage is calculated as the proportion times 100 divided by the total of proportions for this area.

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Appendix Table 7. U.S./Canada salmon interception research percent contribution calculation example, 1982 (continued).

1982 Sockeye	Recoveries from (code	103 103)			
Noyes Island Releases	Period	Recovered	Released	Proportion	Contribution (%)
	Other	0	0	.0000	.0
	Early June	0	0	.0000	.0
	Late June	14	1415	.0099	1.5
	Early July	7	710	.0099	1.5
	Late July	0	473	.0000	.0
	Early Aug	0	131	.0000	.0
	Late Aug	1	84	.0119	1.8
	Early Sept	0	0	.0000	.0
	Late Sept	0	0	.0000	.0
	Total	22	2813		
Dall Island Releases	Period	Recovered	Released	Proportion	Contribution (%)
	Other	0	0	.0000	.0
	Early June	0	0	.0000	.0
	Late June	6	642	.0093	1.4
	Early July	0	74	.0000	.0
	Late July	8	615	.0130	2.0
	Early Aug	1	109	.0092	1.4
	Late Aug	0	3	.0000	.0
	Early Sept	0	0	.0000	.0
	Late Sept	0	0	.0000	.0
	Total	15	1443		
Middle Clarence Releases	Period	Recovered	Released	Proportion	Contribution (%)
	Other	0	0	.0000	.0
	Early June	0	0	.0000	.0
	Late June	0	0	.0000	.0
	Early July	0	81	.0000	.0
	Late July	0	40	.0000	.0
	Early Aug	1	15	.0667	10.3
	Late Aug	0	0	.0000	.0
	Early Sept	0	0	.0000	.0
	Late Sept	0	0	.0000	.0
	Total	1	136		

- Notes: (1) Proportion is the number recovered in the specified area divided by the number released in the specified time and area.
 (2) Contribution percentage is calculated as the proportion times 100 divided by the total of proportions for this area.

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Appendix Table 7. U.S./Canada salmon interception research percent contribution calculation example, 1982 (continued).

1982 Sockeye	Recoveries from (code	103 103)			
Total Releases	Period	Recovered	Released	Proportion	Contribution (%)
	Other	0	0	.0000	.0
	Early June	0	2439	.0000	.0
	Late June	31	10731	.0029	.4
	Early July	11	14327	.0008	.1
	Late July	9	16208	.0006	.1
	Early Aug	2	3841	.0005	.1
	Late Aug	2	296	.0068	1.0
	Early Sept	0	15	.0000	.0
	Late Sept	0	0	.0000	.0
	Total	55	47857		

- Notes: (1) Proportion is the number recovered in the specified area divided by the number released in the specified time and area.
 (2) Contribution percentage is calculated as the proportion times 100 divided by the total of proportions for this area.
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Appendix Table 8. Number of pink and sockeye salmon Peterson disk tag recoveries in southern Southeastern Alaska, Districts 101-105, 1982.

Release Location	Recovery Location									
	District 101 Pink Salmon	District 101 Sockeye Salmon	District 102 Pink Salmon	District 102 Sockeye Salmon	District 103 Pink Salmon	District 103 Sockeye Salmon	District 104 Pink Salmon	District 104 Sockeye Salmon	District 105 Pink Salmon	District 105 Sockeye Salmon
Noyes Island	1,384	104	297	26	598	22	344	16	5	0
Dall Island	387	63	153	20	221	15	99	7	3	0
Cape Fox	2,859	189	52	2	6	0	12	1	0	0
Upper Clarence Strait	255	116	176	105	8	0	4	0	0	0
Middle Clarence Strait	1,133	8	432	15	17	1	16	0	0	0
Lower Clarence Strait	1,398	44	954	28	187	3	30	0	3	0
Cordova Bay	164	0	127	0	776	1	18	0	1	0
Union Bay	46	8	7	4	0	0	1	0	0	0
Alaskan Total	7,626	532	2,198	200	1,813	42	524	24	12	0
Langara Island	142	250	11	10	6	13	12	8	0	0
Dundas Island	996	420	33	6	9	0	4	0	0	0
Tracy/Boston Rocks	549	18	4	2	0	0	1	0	0	0
Stephens/Porcher Island	76	20	3	0	0	0	0	0	0	0
Birnie/Maskelyne Island	747	67	5	1	3	0	3	0	0	0
Area 5-1	128	1	7	0	1	0	0	0	0	0

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Appendix Table 8. Number of pink and sockeye salmon Peterson disk tag recoveries in southern Southeastern Alaska, Districts 101-105, 1982 (continued).

Release Location	Recovery Location									
	District 101		District 102		District 103		District 104		District 105	
	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon
Area 1	709	0	311	0	73	0	46	0	1	0
Portland Inlet	117	8	12	0	1	0	0	0	0	0
Skeena River	3	2	0	0	0	0	0	0	0	0
Masset Inlet	18	0	3	0	0	0	0	0	0	0
Kwinamass Bay	10	0	0	0	0	0	0	0	0	0
Khutzymateen Inlet	3	0	0	0	0	0	0	0	0	0
Canadian Total	3,498	786	389	19	93	13	66	8	1	0
Grand Total	11,124	1,318	2,587	219	1,906	55	590	32	13	0

Appendix Table 9. Number of pink and sockeye salmon Peterson disk tag recoveries in southern Southeastern Alaska, Districts 106-110, 1982.

Release Location	Recovery Location									
	District 106		District 107		District 108		District 109		District 110	
	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon
Noyes Island	76	77	65	2	6	4	10	2	10	2
Dall Island	25	2	35	2	2	0	8	1	2	0
Cape Fox	4	1	17	0	0	0	1	0	0	1
Upper Clarence Strait	237	60	201	8	8	1	6	0	12	0
Middle Clarence Strait	266	1	775	0	2	0	7	0	6	0
Lower Clarence Strait	153	1	166	1	1	0	9	0	1	0
Cordova Bay	42	0	17	0	0	0	0	0	0	0
Union Bay	8	0	72	0	1	0	0	0	0	0
Alaskan Total	811	142	1,348	13	20	5	41	3	31	3
Langara Island	2	4	4	1	0	0	7	0	3	0
Dundas Island	2	0	3	0	0	0	0	0	0	0
Tracy/Boston Rocks	0	0	0	0	0	0	0	0	0	0
Stephens/Porcher Island	0	0	0	0	0	0	0	0	0	0
Birnie/Maskelyne Island	0	1	1	0	0	0	0	0	0	0
Area 5-1	3	0	4	0	0	0	0	0	0	0

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Appendix Table 9. Number of pink and sockeye salmon Peterson disk tag recoveries in southern Southeastern Alaska, Districts 106-110, 1982 (continued).

Release Location	Recovery Location									
	District 106		District 107		District 108		District 109		District 110	
	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon
Area 1	57	0	82	0	1	0	14	0	8	0
Portland Inlet	4	0	3	0	0	0	0	0	0	0
Skeena River	0	0	0	0	0	0	0	0	0	0
Masset Inlet	0	0	0	0	0	0	0	0	0	0
Kwinamass Bay	0	0	0	0	0	0	0	0	0	0
Khutzmateen Inlet	0	0	0	0	0	0	0	0	0	0
Canadian Total	68	5	97	1	1	0	21	1	11	0
Grand Total	879	147	1,445	14	21	5	62	4	42	3

Appendix Table 10. Number of pink and sockeye salmon Peterson disk tag recoveries in northern British Columbia, 1982.

Release Location	Recovery Location									
	Skeena River Pink Salmon	Skeena River Sockeye Salmon	Nass River Pink Salmon	Nass River Sockeye Salmon	Portland Inlet Pink Salmon	Portland Inlet Sockeye Salmon	Masset Inlet Pink Salmon	Masset Inlet Sockeye Salmon	Area 6 Pink Salmon	Area 6 Sockeye Salmon
Noyes Island	8	70	3	52	2	0	3	0	0	0
Dall Island	6	26	0	30	0	0	0	0	0	0
Cape Fox	5	18	5	84	15	0	0	0	0	0
Upper Clarence Strait	2	37	23	7	0	0	0	0	0	0
Middle Clarence Strait	3	2	0	0	0	0	0	0	0	0
Lower Clarence Strait	1	2	0	10	0	0	0	0	0	0
Cordova Bay	1	0	0	0	0	0	0	0	0	0
Union Bay	0	3	0	0	0	0	0	0	0	0
Alaskan Total	26	158	31	183	17	0	3	0	0	0
Langara Island	2	269	1	117	3	0	1	0	2	0
Dundas Island	47	567	3	238	21	0	0	0	3	0
Tracy/Boston Rocks	2	13	1	133	23	0	0	0	0	0
Stephens/Porcher Island	134	530	0	6	5	0	0	0	0	0
Birnie/Maskelyne Island	32	57	4	587	51	0	0	0	1	0
Area 5-1	71	63	6	0	4	0	0	0	2	0

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Appendix Table 10. Number of pink and sockeye salmon Peterson disk tag recoveries in northern British Columbia, 1982 (continued).

Release Location	Recovery Location									
	Skeena River		Nass River		Portland Inlet		Masset Inlet		Area 6	
	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon	Pink Salmon	Sockeye Salmon
Area 1	13	0	2	0	4	0	5	0	0	0
Portland Inlet	0	9	3	92	54	0	0	0	1	0
Skeena River	30	339	0	3	0	1	0	0	0	0
Masset Inlet	2	0	0	0	0	0	0	0	0	0
Kwinamass Bay	0	0	0	0	93	0	0	0	0	0
Khutzymateen Inlet	0	0	0	0	7	0	0	0	0	0
Canadian Total	333	1,847	20	1,176	265	1	6	0	9	0
Grand Total	359	2,005	51	1,359	282	1	9	0	9	0

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982.

Sockeye

Released at Noyes Island

	Other	101	102	103	104	105	106	107	108	109
Early	12 (2)	84 (16)	23 (4)	14 (3)	3 (1)	0 (0)	67 (13)	2 (0)	4 (1)	0 (0)
Middle	5 (1)	19 (4)	2 (0)	7 (1)	8 (2)	0 (0)	10 (2)	0 (0)	0 (0)	1 (0)
Late	3 (1)	1 (0)	1 (0)	1 (0)	5 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	20 (4)	104 (20)	26 (5)	22 (4)	16 (3)	0 (0)	77 (15)	2 (0)	4 (1)	1 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	11 (2)	44 (8)	47 (9)	16 (3)	5 (1)	1 (0)	8 (2)	0 (0)	341 (65)
Middle	1 (0)	1 (0)	52 (10)	8 (2)	4 (1)	15 (3)	11 (2)	19 (4)	0 (0)	163 (31)
Late	0 (0)	0 (0)	4 (1)	0 (0)	1 (0)	2 (0)	0 (0)	0 (0)	0 (0)	18 (3)
Total	1 (0)	12 (2)	100 (19)	55 (11)	21 (4)	22 (4)	12 (2)	27 (5)	0 (0)	522 (100)

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye

Released at Dall Island

	Other	101	102	103	104	105	106	107	108	109
Early	3 (1)	46 (18)	10 (4)	6 (2)	5 (2)	0 (0)	2 (1)	2 (1)	0 (0)	0 (0)
Middle	4 (2)	13 (5)	10 (4)	8 (3)	2 (1)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)
Late	0 (0)	4 (2)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	7 (3)	63 (24)	20 (8)	15 (6)	7 (3)	0 (0)	2 (1)	2 (1)	0 (0)	1 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	3 (1)	9 (3)	21 (8)	8 (3)	9 (3)	0 (0)	3 (1)	0 (0)	127 (49)
Middle	0 (0)	0 (0)	32 (12)	10 (4)	3 (1)	5 (2)	9 (3)	16 (6)	0 (0)	113 (44)
Late	0 (0)	0 (0)	7 (3)	2 (1)	4 (2)	0 (0)	0 (0)	0 (0)	0 (0)	18 (7)
Total	0 (0)	3 (1)	48 (19)	33 (13)	15 (6)	14 (5)	9 (3)	19 (7)	0 (0)	258 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye Released at Cape Fox										
	Other	101	102	103	104	105	106	107	108	109
Early	4 (1)	50 (11)	1 (0)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)
Middle	8 (2)	128 (28)	1 (0)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	1 (0)	11 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	13 (3)	189 (42)	2 (0)	0 (0)	1 (0)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	2 (0)	23 (5)	39 (9)	1 (0)	0 (0)	2 (0)	0 (0)	123 (27)
Middle	1 (0)	0 (0)	34 (8)	54 (12)	16 (4)	37 (8)	3 (1)	20 (4)	0 (0)	303 (67)
Late	0 (0)	0 (0)	0 (0)	7 (2)	3 (1)	2 (0)	0 (0)	0 (0)	0 (0)	24 (5)
Total	1 (0)	0 (0)	36 (8)	84 (19)	58 (13)	40 (9)	3 (1)	22 (5)	0 (0)	450 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye

Released at Upper Clarence

	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	31 (7)	102 (22)	95 (20)	0 (0)	0 (0)	0 (0)	53 (11)	8 (2)	1 (0)	0 (0)
Late	4 (1)	14 (3)	10 (2)	0 (0)	0 (0)	0 (0)	7 (1)	0 (0)	0 (0)	0 (0)
Total	35 (7)	116 (25)	105 (22)	0 (0)	0 (0)	0 (0)	60 (13)	8 (2)	1 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	37 (8)	4 (1)	6 (1)	38 (8)	13 (3)	20 (4)	0 (0)	408 (87)
Late	0 (0)	0 (0)	16 (3)	3 (1)	2 (0)	3 (1)	0 (0)	1 (0)	0 (0)	60 (13)
Total	0 (0)	0 (0)	53 (11)	7 (1)	8 (2)	41 (9)	13 (3)	21 (4)	0 (0)	468 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye Released at Middle Clarence										
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	2 (6)	8 (25)	13 (41)	0 (0)	0 (0)	0 (0)	1 (3)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	2 (6)	1 (3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	2 (6)	8 (25)	15 (47)	1 (3)	0 (0)	0 (0)	1 (3)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	2 (6)	0 (0)	1 (3)	1 (3)	0 (0)	0 (0)	0 (0)	28 (88)
Late	0 (0)	0 (0)	0 (0)	0 (0)	1 (3)	0 (0)	0 (0)	0 (0)	0 (0)	4 (13)
Total	0 (0)	0 (0)	2 (6)	0 (0)	2 (6)	1 (3)	0 (0)	0 (0)	0 (0)	32 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye		Released at Lower Clarence								
	Other	101	102	103	104	105	106	107	108	109
Early	1 (1)	23 (23)	23 (23)	3 (3)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)
Middle	1 (1)	17 (17)	3 (3)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)
Late	0 (0)	4 (4)	2 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	2 (2)	44 (43)	28 (27)	3 (3)	0 (0)	0 (0)	1 (1)	1 (1)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	1 (1)	8 (8)	1 (1)	0 (0)	0 (0)	1 (1)	0 (0)	62 (61)
Middle	0 (0)	0 (0)	3 (3)	2 (2)	1 (1)	1 (1)	0 (0)	4 (4)	0 (0)	33 (32)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	7 (7)
Total	0 (0)	0 (0)	4 (4)	10 (10)	2 (2)	2 (2)	0 (0)	5 (5)	0 (0)	102 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye Released at Cordova Bay										
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (100)
Total	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye		Released at Union Bay								
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	8 (42)	3 (16)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	1 (5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	8 (42)	4 (21)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	3 (16)	0 (0)	1 (5)	2 (11)	1 (5)	0 (0)	0 (0)	18 (95)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (5)
Total	0 (0)	0 (0)	3 (16)	0 (0)	1 (5)	2 (11)	1 (5)	0 (0)	0 (0)	19 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye

Released at Langara

	Other	101	102	103	104	105	106	107	108	109
Early	31 (2)	196 (15)	10 (1)	8 (1)	5 (0)	0 (0)	3 (0)	0 (0)	0 (0)	0 (0)
Middle	28 (2)	54 (4)	0 (0)	5 (0)	3 (0)	0 (0)	1 (0)	1 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	59 (4)	250 (19)	10 (1)	13 (1)	8 (1)	0 (0)	4 (0)	1 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	260 (20)	105 (8)	112 (8)	69 (5)	25 (2)	45 (3)	0 (0)	869 (66)
Middle	0 (0)	2 (0)	141 (11)	32 (2)	36 (3)	63 (5)	25 (2)	61 (5)	0 (0)	452 (34)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	2 (0)	401 (30)	137 (10)	148 (11)	132 (10)	50 (4)	106 (8)	0 (0)	1321 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye Released at Dundas										
	Other	101	102	103	104	105	106	107	108	109
Early	2 (0)	138 (6)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	76 (3)	279 (11)	5 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	2 (0)	3 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	80 (3)	420 (17)	6 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	37 (2)	93 (4)	67 (3)	19 (1)	1 (0)	4 (0)	0 (0)	362 (15)
Middle	0 (0)	0 (0)	928 (38)	158 (6)	102 (4)	200 (8)	68 (3)	174 (7)	0 (0)	1990 (81)
Late	0 (0)	0 (0)	88 (4)	0 (0)	8 (0)	6 (0)	0 (0)	2 (0)	0 (0)	109 (4)
Total	0 (0)	0 (0)	1053 (43)	251 (10)	177 (7)	225 (9)	69 (3)	180 (7)	0 (0)	2461 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye		Released at Tracy/Boston								
	Other	101	102	103	104	105	106	107	108	109
Early	1 (0)	6 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	2 (1)	11 (4)	2 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	3 (1)	18 (7)	2 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	3 (1)	57 (22)	35 (13)	4 (2)	0 (0)	0 (0)	0 (0)	106 (41)
Middle	0 (0)	0 (0)	24 (9)	75 (29)	12 (5)	13 (5)	3 (1)	11 (4)	0 (0)	153 (59)
Late	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (1)
Total	0 (0)	0 (0)	27 (10)	133 (51)	47 (18)	17 (7)	3 (1)	11 (4)	0 (0)	261 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye		Released at Stevens/Porcher								
	Other	101	102	103	104	105	106	107	108	109
Early	1 (0)	5 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)
Middle	30 (3)	15 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	31 (3)	20 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	259 (24)	5 (0)	6 (1)	1 (0)	0 (0)	11 (1)	0 (0)	289 (26)
Middle	0 (0)	0 (0)	521 (47)	4 (0)	10 (1)	40 (4)	40 (4)	86 (8)	0 (0)	746 (68)
Late	0 (0)	0 (0)	60 (5)	1 (0)	1 (0)	0 (0)	3 (0)	1 (0)	0 (0)	66 (6)
Total	0 (0)	0 (0)	840 (76)	10 (1)	17 (2)	41 (4)	43 (4)	98 (9)	0 (0)	1101 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye		Released at Birnie/Maskelyne								
	Other	101	102	103	104	105	106	107	108	109
Early	3 (0)	17 (1)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	11 (1)	45 (3)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	5 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	14 (1)	67 (5)	1 (0)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)

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	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	17 (1)	395 (28)	491 (35)	15 (1)	0 (0)	5 (0)	0 (0)	944 (68)
Middle	0 (0)	0 (0)	89 (6)	192 (14)	38 (3)	23 (2)	11 (1)	15 (1)	0 (0)	425 (31)
Late	0 (0)	0 (0)	13 (1)	1 (0)	1 (0)	2 (0)	1 (0)	0 (0)	0 (0)	23 (2)
Total	0 (0)	0 (0)	119 (9)	588 (42)	530 (38)	40 (3)	12 (1)	20 (1)	0 (0)	1392 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye

Released at Area 5-1

	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	2 (2)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	2 (2)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	4 (5)	0 (0)	1 (1)	0 (0)	1 (1)	1 (1)	0 (0)	7 (8)
Late	0 (0)	0 (0)	62 (75)	0 (0)	8 (10)	2 (2)	1 (1)	0 (0)	0 (0)	76 (92)
Total	0 (0)	0 (0)	66 (80)	0 (0)	9 (11)	2 (2)	2 (2)	1 (1)	0 (0)	83 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye

Released at Area 1

	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	1 (50)	0 (0)	0 (0)	1 (50)	0 (0)	0 (0)	0 (0)	2 (100)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	0 (0)	1 (50)	0 (0)	0 (0)	1 (50)	0 (0)	0 (0)	0 (0)	2 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye		Released at Portland Inlet								
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	2 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	3 (1)	6 (3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	3 (1)	8 (3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

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	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	20 (9)	84 (36)	4 (2)	1 (0)	0 (0)	0 (0)	111 (47)
Middle	0 (0)	0 (0)	11 (5)	72 (31)	12 (5)	7 (3)	4 (2)	9 (4)	0 (0)	124 (53)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	0 (0)	11 (5)	92 (39)	96 (41)	11 (5)	5 (2)	9 (4)	0 (0)	235 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye

Released at Skeena Secondary

	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	10 (2)	2 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	10 (2)	2 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

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	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	512 (92)	3 (1)	5 (1)	7 (1)	7 (1)	11 (2)	0 (0)	557 (100)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	0 (0)	512 (92)	3 (1)	5 (1)	7 (1)	7 (1)	11 (2)	0 (0)	557 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye Released at Masset Secondary										
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye		Released at Nass Secondary								
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye		Released at Kwinamass Secondary								
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Sockeye

Released at Khutzymateen Secondary

	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink										
Released at Noyes Island										
	Other	101	102	103	104	105	106	107	108	109
Early	6 (0)	9 (0)	1 (0)	1 (0)	3 (0)	0 (0)	6 (0)	0 (0)	3 (0)	3 (0)
Middle	9 (0)	34 (1)	6 (0)	8 (0)	11 (0)	0 (0)	2 (0)	3 (0)	1 (0)	3 (0)
Late	156 (5)	1341 (43)	290 (9)	589 (19)	330 (11)	5 (0)	68 (2)	60 (2)	2 (0)	4 (0)
Total	171 (6)	1384 (45)	297 (10)	598 (19)	344 (11)	5 (0)	76 (2)	63 (2)	6 (0)	10 (0)

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	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	4 (0)	15 (0)	2 (0)	1 (0)	2 (0)	0 (0)	0 (0)	0 (0)	0 (0)	56 (2)
Middle	3 (0)	1 (0)	1 (0)	0 (0)	8 (0)	5 (0)	1 (0)	3 (0)	0 (0)	99 (3)
Late	3 (0)	3 (0)	11 (0)	4 (0)	35 (1)	50 (2)	1 (0)	2 (0)	0 (0)	2954 (95)
Total	10 (0)	19 (1)	14 (0)	5 (0)	45 (1)	55 (2)	2 (0)	5 (0)	0 (0)	3109 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink										
Released at Dall Island										
	Other	101	102	103	104	105	106	107	108	109
Early	1 (0)	12 (1)	0 (0)	0 (0)	0 (0)	0 (0)	3 (0)	1 (0)	0 (0)	1 (0)
Middle	7 (1)	40 (4)	5 (0)	0 (0)	5 (0)	0 (0)	2 (0)	4 (0)	1 (0)	1 (0)
Late	52 (5)	335 (32)	148 (14)	221 (21)	94 (9)	3 (0)	20 (2)	30 (3)	1 (0)	6 (1)
Total	60 (6)	387 (37)	153 (15)	221 (21)	99 (9)	3 (0)	25 (2)	35 (3)	2 (0)	8 (1)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	1 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	20 (2)
Middle	2 (0)	1 (0)	2 (0)	0 (0)	2 (0)	1 (0)	2 (0)	0 (0)	0 (0)	75 (7)
Late	0 (0)	1 (0)	5 (0)	0 (0)	27 (3)	12 (1)	0 (0)	0 (0)	0 (0)	955 (91)
Total	2 (0)	2 (0)	7 (1)	1 (0)	30 (3)	13 (1)	2 (0)	0 (0)	0 (0)	1050 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink		Released at Cape Fox								
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	2 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)
Middle	58 (2)	742 (20)	12 (0)	2 (0)	4 (0)	0 (0)	4 (0)	16 (0)	0 (0)	0 (0)
Late	227 (6)	2115 (58)	40 (1)	4 (0)	8 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)
Total	285 (8)	2859 (79)	52 (1)	6 (0)	12 (0)	0 (0)	4 (0)	17 (0)	0 (0)	1 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (0)
Middle	0 (0)	2 (0)	10 (0)	5 (0)	53 (1)	61 (2)	2 (0)	6 (0)	0 (0)	977 (27)
Late	0 (0)	0 (0)	3 (0)	0 (0)	147 (4)	107 (3)	5 (0)	0 (0)	0 (0)	2657 (73)
Total	0 (0)	2 (0)	13 (0)	5 (0)	200 (5)	168 (5)	7 (0)	6 (0)	0 (0)	3637 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink		Released at Upper Clarence								
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	41 (4)	40 (4)	9 (1)	0 (0)	1 (0)	0 (0)	74 (7)	67 (6)	5 (0)	0 (0)
Late	48 (5)	215 (21)	167 (16)	8 (1)	3 (0)	0 (0)	163 (16)	134 (13)	3 (0)	6 (1)
Total	89 (9)	255 (25)	176 (17)	8 (1)	4 (0)	0 (0)	237 (23)	201 (19)	8 (1)	6 (1)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	11 (1)	3 (0)	2 (0)	0 (0)	0 (0)	2 (0)	0 (0)	0 (0)	0 (0)	255 (25)
Late	1 (0)	0 (0)	1 (0)	23 (2)	1 (0)	3 (0)	0 (0)	0 (0)	0 (0)	776 (75)
Total	12 (1)	3 (0)	3 (0)	23 (2)	1 (0)	5 (0)	0 (0)	0 (0)	0 (0)	1031 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink		Released at Middle Clarence								
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	40 (1)	104 (4)	13 (0)	1 (0)	7 (0)	0 (0)	9 (0)	91 (3)	1 (0)	1 (0)
Late	62 (2)	1029 (37)	419 (15)	16 (1)	9 (0)	0 (0)	257 (9)	684 (25)	1 (0)	6 (0)
Total	102 (4)	1133 (41)	432 (16)	17 (1)	16 (1)	0 (0)	266 (10)	775 (28)	2 (0)	7 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	5 (0)	2 (0)	3 (0)	0 (0)	2 (0)	4 (0)	0 (0)	1 (0)	0 (0)	284 (10)
Late	1 (0)	0 (0)	1 (0)	1 (0)	0 (0)	3 (0)	2 (0)	0 (0)	0 (0)	2491 (90)
Total	6 (0)	2 (0)	4 (0)	1 (0)	2 (0)	7 (0)	2 (0)	1 (0)	0 (0)	2775 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink		Released at Lower Clarence								
	Other	101	102	103	104	105	106	107	108	109
Early	2 (0)	25 (1)	0 (0)	0 (0)	1 (0)	0 (0)	1 (0)	3 (0)	0 (0)	0 (0)
Middle	4 (0)	77 (3)	3 (0)	1 (0)	1 (0)	0 (0)	1 (0)	3 (0)	0 (0)	0 (0)
Late	85 (3)	1296 (43)	951 (32)	186 (6)	28 (1)	3 (0)	151 (5)	160 (5)	1 (0)	9 (0)
Total	91 (3)	1398 (46)	954 (32)	187 (6)	30 (1)	3 (0)	153 (5)	166 (6)	1 (0)	9 (0)

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	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	33 (1)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	2 (0)	2 (0)	0 (0)	0 (0)	0 (0)	94 (3)
Late	1 (0)	0 (0)	3 (0)	0 (0)	4 (0)	2 (0)	1 (0)	0 (0)	0 (0)	2881 (96)
Total	1 (0)	0 (0)	3 (0)	0 (0)	7 (0)	4 (0)	1 (0)	0 (0)	0 (0)	3008 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink		Released at Cordova Bay								
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	63 (5)	164 (13)	127 (10)	776 (64)	18 (1)	1 (0)	42 (3)	17 (1)	0 (0)	0 (0)
Total	63 (5)	164 (13)	127 (10)	776 (64)	18 (1)	1 (0)	42 (3)	17 (1)	0 (0)	0 (0)

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	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	2 (0)	0 (0)	3 (0)	3 (0)	0 (0)	0 (0)	0 (0)	1216 (100)
Total	0 (0)	0 (0)	2 (0)	0 (0)	3 (0)	3 (0)	0 (0)	0 (0)	0 (0)	1216 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink										
Released at Union Bay										
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	21 (13)	12 (7)	3 (2)	0 (0)	0 (0)	0 (0)	1 (1)	25 (16)	1 (1)	0 (0)
Late	3 (2)	34 (21)	4 (2)	0 (0)	1 (1)	0 (0)	7 (4)	47 (29)	0 (0)	0 (0)
Total	24 (15)	46 (29)	7 (4)	0 (0)	1 (1)	0 (0)	8 (5)	72 (45)	1 (1)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	64 (40)
Late	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	97 (60)
Total	0 (0)	0 (0)	0 (0)	0 (0)	2 (1)	0 (0)	0 (0)	0 (0)	0 (0)	161 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink		Released at Langara								
	Other	101	102	103	104	105	106	107	108	109
Early	7 (2)	70 (24)	4 (1)	2 (1)	4 (1)	0 (0)	1 (0)	2 (1)	0 (0)	0 (0)
Middle	13 (4)	63 (22)	5 (2)	3 (1)	8 (3)	0 (0)	1 (0)	2 (1)	0 (0)	7 (2)
Late	0 (0)	9 (3)	2 (1)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	20 (7)	142 (48)	11 (4)	6 (2)	12 (4)	0 (0)	2 (1)	4 (1)	0 (0)	7 (2)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	1 (0)	5 (2)	1 (0)	13 (4)	13 (4)	4 (1)	1 (0)	1 (0)	129 (44)
Middle	3 (1)	1 (0)	7 (2)	1 (0)	10 (3)	17 (6)	2 (1)	6 (2)	1 (0)	150 (51)
Late	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	1 (0)	0 (0)	0 (0)	0 (0)	14 (5)
Total	3 (1)	2 (1)	12 (4)	2 (1)	24 (8)	31 (11)	6 (2)	7 (2)	2 (1)	293 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink										
Released at Dundas										
	Other	101	102	103	104	105	106	107	108	109
Early	1 (0)	45 (2)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)
Middle	18 (1)	159 (8)	5 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)
Late	71 (3)	792 (39)	27 (1)	9 (0)	4 (0)	0 (0)	2 (0)	1 (0)	0 (0)	0 (0)
Total	90 (4)	996 (49)	33 (2)	9 (0)	4 (0)	0 (0)	2 (0)	3 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	8 (0)	1 (0)	1 (0)	0 (0)	59 (3)
Middle	0 (0)	1 (0)	62 (3)	3 (0)	59 (3)	73 (4)	9 (0)	25 (1)	1 (0)	416 (20)
Late	0 (0)	0 (0)	33 (2)	3 (0)	171 (8)	451 (22)	2 (0)	1 (0)	2 (0)	1569 (77)
Total	0 (0)	1 (0)	95 (5)	6 (0)	231 (11)	532 (26)	12 (1)	27 (1)	3 (0)	2044 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink		Released at Tracy/Boston								
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	2 (0)	41 (5)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	29 (3)	508 (59)	3 (0)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	31 (4)	549 (64)	4 (0)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	5 (1)	1 (0)	31 (4)	18 (2)	1 (0)	2 (0)	0 (0)	102 (12)
Late	0 (0)	0 (0)	2 (0)	0 (0)	127 (15)	91 (11)	1 (0)	0 (0)	0 (0)	762 (88)
Total	0 (0)	0 (0)	7 (1)	1 (0)	158 (18)	109 (13)	2 (0)	2 (0)	0 (0)	864 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink		Released at Stevens/Porcher								
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	10 (2)	26 (4)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	34 (6)	50 (8)	2 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	44 (7)	76 (13)	3 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	83 (14)	0 (0)	10 (2)	20 (3)	17 (3)	37 (6)	0 (0)	204 (34)
Late	0 (0)	0 (0)	145 (24)	34 (6)	76 (13)	33 (6)	9 (2)	11 (2)	0 (0)	394 (66)
Total	0 (0)	0 (0)	228 (38)	34 (6)	86 (14)	53 (9)	26 (4)	48 (8)	0 (0)	598 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink		Released at Birnie/Maskelyne								
	Other	101	102	103	104	105	106	107	108	109
Early	1 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	1 (0)	39 (3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	73 (5)	707 (49)	5 (0)	3 (0)	3 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)
Total	75 (5)	747 (52)	5 (0)	3 (0)	3 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	1 (0)	2 (0)	2 (0)	0 (0)	0 (0)	0 (0)	7 (0)
Middle	0 (0)	0 (0)	7 (0)	2 (0)	32 (2)	25 (2)	1 (0)	5 (0)	1 (0)	113 (8)
Late	0 (0)	0 (0)	33 (2)	2 (0)	259 (18)	218 (15)	4 (0)	2 (0)	0 (0)	1310 (92)
Total	0 (0)	0 (0)	40 (3)	5 (0)	293 (20)	245 (17)	5 (0)	7 (0)	1 (0)	1430 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink		Released at Area 5-1								
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	2 (0)	3 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	56 (12)	125 (26)	7 (1)	1 (0)	0 (0)	0 (0)	3 (1)	4 (1)	0 (0)	0 (0)
Total	58 (12)	128 (27)	7 (1)	1 (0)	0 (0)	0 (0)	3 (1)	4 (1)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	1 (0)	2 (0)	2 (0)	1 (0)	0 (0)	0 (0)	11 (2)
Late	0 (0)	0 (0)	87 (18)	21 (4)	108 (23)	42 (9)	4 (1)	4 (1)	2 (0)	464 (98)
Total	0 (0)	0 (0)	87 (18)	22 (5)	110 (23)	44 (9)	5 (1)	4 (1)	2 (0)	475 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink		Released at Area 1								
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	23 (2)	217 (15)	94 (6)	15 (1)	22 (1)	1 (0)	17 (1)	36 (2)	0 (0)	10 (1)
Late	47 (3)	492 (33)	217 (15)	58 (4)	24 (2)	0 (0)	40 (3)	46 (3)	1 (0)	4 (0)
Total	70 (5)	709 (48)	311 (21)	73 (5)	46 (3)	1 (0)	57 (4)	82 (6)	1 (0)	14 (1)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	7 (0)	3 (0)	3 (0)	0 (0)	7 (0)	14 (1)	0 (0)	2 (0)	0 (0)	471 (32)
Late	1 (0)	1 (0)	14 (1)	4 (0)	29 (2)	21 (1)	1 (0)	1 (0)	0 (0)	1001 (68)
Total	8 (1)	4 (0)	17 (1)	4 (0)	36 (2)	35 (2)	1 (0)	3 (0)	0 (0)	1472 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink										
Released at Portland Inlet										
	Other	101	102	103	104	105	106	107	108	109
Early	0	0	0	0	0	0	0	0	0	0
	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Middle	8	74	0	0	0	0	0	0	0	0
	(2)	(22)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Late	0	43	12	1	0	0	4	3	0	0
	(0)	(13)	(4)	(0)	(0)	(0)	(1)	(1)	(0)	(0)
Total	8	117	12	1	0	0	4	3	0	0
	(2)	(35)	(4)	(0)	(0)	(0)	(1)	(1)	(0)	(0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0	0	0	0	0	0	0	0	0	0
	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Middle	0	0	17	3	75	82	1	3	1	264
	(0)	(0)	(5)	(1)	(22)	(24)	(0)	(1)	(0)	(79)
Late	0	0	0	0	3	6	0	0	0	72
	(0)	(0)	(0)	(0)	(1)	(2)	(0)	(0)	(0)	(21)
Total	0	0	17	3	78	88	1	3	1	336
	(0)	(0)	(5)	(1)	(23)	(26)	(0)	(1)	(0)	(100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink

Released at Skeena Secondary

	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	1 (2)	2 (4)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	1 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	1 (2)	3 (6)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

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	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	13 (27)	0 (0)	0 (0)	0 (0)	2 (4)	2 (4)	0 (0)	20 (41)
Late	0 (0)	0 (0)	28 (57)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	29 (59)
Total	0 (0)	0 (0)	41 (84)	0 (0)	0 (0)	0 (0)	2 (4)	2 (4)	0 (0)	49 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported seperately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported seperately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink		Released at Masset Secondary								
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	18 (67)	3 (11)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	18 (67)	3 (11)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	3 (11)	0 (0)	1 (4)	2 (7)	0 (0)	0 (0)	0 (0)	27 (100)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	0 (0)	3 (11)	0 (0)	1 (4)	2 (7)	0 (0)	0 (0)	0 (0)	27 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink		Released at Nass Secondary								
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

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	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported seperately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported seperately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink										
Released at Kwinamass Secondary										
	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	5 (3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	5 (3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	0 (0)	10 (5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	1 (1)	0 (0)	30 (15)	51 (26)	0 (0)	0 (0)	0 (0)	87 (44)
Late	0 (0)	0 (0)	0 (0)	0 (0)	38 (19)	68 (34)	0 (0)	0 (0)	0 (0)	111 (56)
Total	0 (0)	0 (0)	1 (1)	0 (0)	68 (34)	119 (60)	0 (0)	0 (0)	0 (0)	198 (100)

-Continued-

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

Appendix Table 11. U.S./Canada salmon interception tag recoveries in numbers and (percent) by species, release location, release time, and recovery area, 1982 (continued).

Pink

Released at Khutzymateen Secondary

	Other	101	102	103	104	105	106	107	108	109
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	1 (4)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Late	0 (0)	3 (13)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	1 (4)	3 (13)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

	110	NSE AK	Skeena	Nass	Area 1	Area 3	Area 4	Area 5	Area 6	Total
Early	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Middle	0 (0)	0 (0)	0 (0)	0 (0)	1 (4)	2 (9)	0 (0)	0 (0)	0 (0)	4 (17)
Late	0 (0)	0 (0)	0 (0)	0 (0)	7 (30)	9 (39)	0 (0)	0 (0)	0 (0)	19 (83)
Total	0 (0)	0 (0)	0 (0)	0 (0)	8 (35)	11 (48)	0 (0)	0 (0)	0 (0)	23 (100)

Notes:

- (1) Other includes Area 2, multiple areas, and unspecified area recoveries.
- (2) NSE AK includes Districts 111 through 116, 181, 183, 186, and 189.
- (3) Area 3 does not include Nass River in-stream recoveries which are reported separately.
- (4) Area 4 does not include Skeena River in-stream recoveries which are reported separately.
- (5) Early tagging is in June, Middle is in July, and Late is in August and September.
- (6) Percents may not sum to 100 due to rounding.

APPENDIX 12

MATHEMATICAL FORMULATION OF PROCEDURES USED FOR
ESTIMATION OF NATIONAL CONTRIBUTION RATES

Appendix 12. Mathematical formulation of procedures used for estimation of national contribution rates.

Of primary interest in this investigation is the estimation of national contribution rates of salmon of U.S. and Canadian origins to mixed stock populations in area/time strata generally representative of certain 'intercepting' fisheries. The term 'national contribution rate' is used here to draw a distinction between the national stock contribution rate relative to a population of fish in a study area (or any area/time strata) and an 'interception' rate as applied to the catch of salmon in a particular fishery. For convenience of terminology, an area/time strata or study area will often be referred to as a fishery, however, the distinction between national contribution rate and interception rate should be well noted.

In the following discussion the symbols '*' and '/' are used to indicate multiplication and division, respectively. Parentheses will be used in place of subscripting; the following notations, for example, should be considered equivalent when referring to an element in a 2-way classification matrix

$$p(i,j) = p_{i,j}$$

The expression SUM[] is used in place of the normal summation symbol Σ with summing indices being placed after the brackets; the following notations for example should be considered equivalent

$$\text{SUM} [f(i,j)]_{i,j} = \sum_{i,j} f(i,j)$$

Given a mixed stock population of fish in an area/time strata (or fishery) f , the proportionate contribution $p(f,s)$ of

$$p(f,s) = N(f,s) / N(f) \quad (1)$$

where $N(f,s)$ = number of stock s fish present in the area/time strata (or fishery) f ,

$$N(f) = \text{SUM}[N(f,s)]_s = \text{total number of fish of all stocks present in area/time strata (or fishery) } f.$$

If all fish present in study area or fishery f are classified into two 'stocks', those of U.S. origin and those of Canadian origin, then national stock contribution rates are defined by Eq. (1) with $s=1$ and 2.

If each fish in a population (or more strictly a known proportion of the fish from a given national origin) carried a physical identifying tag (e.g., a coded-wire tag) or a biological tag (e.g., a national parasite, scale type, blood type, etc.), national contribution rates could be estimated directly from a sample of the population or of the commercial catch using Eq. (2).

In the absence of a complete, direct stock identification method, national contribution rates or fishery interception rates can also be estimated from adult tagging. If a subpopulation of fish are captured, tagged, and released randomly with respect to national origin, and if the numbers of tagged fish returning to each country can be estimated, then estimates of national contribution rates can be made. To do

this the $N(f,s)$ in Eq. (1) would be replaced by say $T(f,s)$ or the number of tagged fish released in fishery f and returning to country or 'stock' s while the $N(f)$ would be replaced by $T(f)$ or the total number of tagged fish returning to both countries. Thus

$$p(f,s) = T(f,s) / T(f) \quad (2)$$

where $T(f) = \text{SUM}[T(f,s)]_s$. (Mathematically, $N(f,s)$ and $N(f)$ are assumed proportional to $T(f,s)$ and $T(f)$ respectively with the same constant of proportionality, that constant canceling in the numerator and denominator of Eq. (1) to yield Eq. (2).

The number $T(f,s)$ of tagged fish released in fishery f and returning to country or stock s consists of two components which can be designated $E(f,s)$ and $C(f,s)$. $E(f,s)$ represents the number of tagged fish which actually return to terminal spawning areas of a country or stock s thus identifying their origin. The $E(f,s)$ can be estimated directly given adequate spawning ground tag recovery sampling and estimates of escapement. $C(f,s)$ represents the number of tagged fish of stocks s released in fishery f but captured in other fisheries while enroute to spawning grounds. The $C(f,s)$ generally cannot be estimated directly from catch sampling since the stock origin of an individual tagged fish recovered in a fishery is not known. $T(f,s)$ can then be expressed as

$$T(f,s) = E(f,s) + C(f,s) \quad (3)$$

The $C(f,s)$ can be expressed as the sum of tagged fish recovered in all individual intervening fisheries as

$$C(f,s) = \text{SUM}[C(f,s,i)]_i$$

where $C(f,s,i)$ = number of fish of stock s originally tagged and released in fishery f but recaptured in fishery i .

$C(f,s,i)$ can also be written

$$C(f,s,i) = R(f,i) * p(i,s)$$

where $R(f,i)$ = number of tagged fish released in fishery f and recaptured in fishery i

$p(i,s)$ = proportion of fish in fishery i belonging to stock s . (Note this is the same as $p(f,s)$ with f replaced by i .)

Summing $T(f,s)$ for all stocks (i.e., over s) to obtain $T(f)$, the denominator in Eq. (2), yields

$$\begin{aligned} T(f) &= \text{SUM}[T(f,s)]_s = \text{SUM}[E(f,s)]_s + \text{SUM}[C(f,s)]_s \\ &= \text{SUM}[E(f,s)]_s + \\ &\quad \text{SUM}[\text{SUM}[R(f,i) * p(i,s)]_i]_s \end{aligned} \quad (4)$$

If in the second expression on the right side of Eq. (4) the order of summing on s and i is interchanged, this expression reduces to $\text{SUM}[R(f,i)]i$ since $\text{SUM}[p(i,s)]s = 1$.

Thus Eq. (4) reduces to

$$\begin{aligned} T(f) &= \text{SUM}[T(f,s)]s \\ &= \text{SUM}[E(f,s)]s + \text{SUM}[R(f,i)]i \end{aligned} \quad (5)$$

Finally, using the above expressions for $T(f,s)$ and $T(f)$, Eq. (2) can be rewritten

$$\begin{aligned} \{\text{SUM}[E(f,s)]s + \text{SUM}[R(f,i)]i\} * p(f,s) = \\ E(f,s) + \text{SUM}[R(f,i) * p(i,s)]i \end{aligned} \quad (6)$$

For a single value of f and a single value of s , Eq. (6) represents one linear equation in F unknowns, namely $p(1,s), p(2,s), \dots, p(F,s)$, where F is the total number of intercepting fisheries. For a fixed value of s and for $f=1, 2, \dots, F$, a set of F linear equations with F unknowns, the $p(f,s)$'s are generated. This resulting set of simultaneous equations is then solvable for the p 's under certain conditions.

A set of such simultaneous equations for one value of s (i.e., for one stock) can be written in matrix form as

$$X * P(s) = Y(s) + [Z * P(s)]$$

i.e.,

$$(X-Z) * P(s) = Y(s)$$

or setting $M = X - Z$ and denoting the inverse of M by $\text{INV}(M)$

$$P(s) = \text{INV}(M) * Y \quad (7)$$

where, for s stocks and F fisheries,

$P(s)$ = $F \times 1$ column matrix with the i -th element being $p(i,s)$, i.e., the proportion of stock s in fishery i ,

$Y(s)$ = $F \times 1$ column matrix with the i -th element being the $E(i,s)$ defined above, i.e., the estimated number of tagged fish released in fishery i and reaching terminal spawning areas of stock s ,

X = $F \times F$ diagonal matrix with the (i,i) diagonal element being the sum of (1) the estimated total tagged fish released in the i -th fishery and reaching all s stocks spawning systems and (2) the estimated total tagged fish released in fishery i and recovered in all F intervening fisheries.

Z = $F \times F$ matrix with the (i,j) element being the estimated total tagged fish released in the i -th fishery and recovered in the j -th fishery.

If elements of X , Y , and Z are available from tag recovery sampling of fishery catches and spawning ground escapements, as is the case in this study, then Eq. (7) yields estimates of stock s contribution rates to fisheries $f=1,2,\dots,F$. Then for $s=1,2,\dots,S$ estimates of contributions of all S stocks to all F fisheries are obtained.

$INV(M)$, i.e., the inverse of matrix $M=X=Z$, was calculated using the International Mathematical and Statistical Library (IMSL) subroutine LINVIF. Once calculated, $INV(M)$ was used in Eq. (7) to calculate stock contribution rates for $s=1,2,\dots,S$.

Some Assumptions Made in Estimating Contribution Rates

A number of assumptions are required when using mark/recovery techniques to estimate fish population characteristics. Discussion of common assumptions may be found in a number of sources, e.g., Ricker (1975). Several important assumptions relative to estimation procedures used in the 1982 tagging study are discussed below.

First, inherent in the formulation of the previous section is the assumption that the F fisheries and S stocks as defined are exhaustive and all inclusive. This means, for example, that all stocks present in a study area or 'fishery' are included in the S stocks. If the fish present in a fishery but not included in the S stocks were all from one country, then that country's contribution to the fishery would be underestimated. To the extent that fish from each of the two countries, not included in the S stocks, were present in approximately equal proportions, effects on estimates of national contributions would tend to cancel.

With respect to the 1982 study, a limited number of voluntary tag recoveries were reported from areas outside the study area, i.e., southern Southeastern Alaska Districts 1-8 and northern British Columbia Statistical Areas 1-5. There is currently no way to quantitatively estimate the extent of tagged fish movement outside the study area, either in total or proportionately relative to the two countries. It has been assumed, for the purpose of this analysis, that the net effect of this factor on national contribution rate estimates for 1982 is not significant.

For the purpose of this report, national contribution rate analysis has been conducted on data obtained by combining or pooling tag release data from fairly broad areas generally coinciding with recognized 'intercepting fisheries'. Furthermore, release data has also been pooled for the entire season to generate estimates of average seasonal national contribution rates to the defined 'fisheries'. It has been assumed that tag release time periods and areas in the 1982 study are generally representative of past, normal time/area distributions of the intercepting fisheries. Thus, average seasonal national contribution rates thus estimated are considered indicative of average seasonal interception rates in these fisheries given relative stock abundance and area/time migration patterns existing during the 1982 season.

This is not meant to imply that within time or area differences in national contribution rates do not exist for these fisheries. In fact, such differences are

thought to exist and further detailed analysis of the 1982 data (in conjunction with the 1983 study data for sockeye) should be conducted to delineate these differences. Information on these differences may be useful when designing fishing patterns to achieve management objectives.

Ref. Cited: Ricker, W.E. 1975. Computations and interpretation of biological statistics of fish populations. Bull. Fish. Res. Canada 191.

APPENDIX 13

PRELIMINARY ESTIMATES OF TOTAL 1982 PINK SALMON
ESCAPEMENTS TO SOUTHERN SOUTHEASTERN ALASKA

Appendix 13. Preliminary estimates of total 1982 pink salmon escapements to southern Southeastern Alaska.

As part of the 1982 joint U.S./Canada salmon research studies, an adult salmon tag and recovery program was conducted to obtain estimates of national stock contribution rates to selected fisheries. Estimates of total pink salmon escapements to southern Southeastern Alaska systems are required to estimate total number of tagged fish reaching spawning systems for use in the contribution rate analysis. Preliminary estimates of total escapements are developed below; continuing research on methods of estimating total escapements is expected to provide the basis for more accurate estimates in the future.

Due to the large number (more than 2,000) of pink salmon spawning streams in Southeastern Alaska, it has not been feasible to enumerate total annual escapements into each system by means of weirs, electronic counters, or other adult salmon enumeration techniques. For management purposes, annual indices of escapement consisting of estimates of peak spawning abundance are obtained from aerial and foot surveys of most medium and large systems. (In practice, the single largest count obtained from one of the surveys is used as the peak escapement estimate.) Peak escapements to smaller unsurveyed systems are estimated by multiplying the average peak escapement for surveyed streams with less than 10,000 peak escapement counts by the number of unsurveyed systems, the procedure being applied within each district. (J. Jones, personal communication). In 1982, estimates for unsurveyed systems represented approximately 23% of the total southern Southeastern Alaska peak escapement. Annual pink salmon peak escapements in southern Southeastern Alaska districts since 1960 are shown in Table A13-1.

For management purposes, it has been assumed that peak escapements represent an approximately constant but unknown proportion of total escapements. On the basis of past studies and observations, peak escapements have generally been thought to represent between one-third to three quarters of total escapements depending on physical stream characteristics, spawning migration patterns, stream life, aerial or foot survey counting efficiency, and other factors.

Information on the magnitude of this proportion, and more generally on the quantitative relationship between peak and total escapements for pink salmon in Southeastern Alaska is limited. Secondary tag/recovery experiments conducted on 12 streams in 1982 failed to provide such information due to extensive straying of tagged fish to other systems which precluded estimates of total escapements.

Studies conducted in Alaska during 1961 and 1962 reported by Meyer (1964) probably provide the most extensive data on the relationship between peak and total escapements. Weirs were operated on six Southeastern Alaska streams and one Cook Inlet stream. No attempt was made to distinguish between pink and chum salmon and both species were included in the weir counts as well as aerial and foot survey counts.

While the 1961-62 study directly considered the question of accuracy of aerial and foot surveys compared to cumulative weir counts at different times during the season, it did not consider peak count estimates per se. However, data on total season weir counts is reported and maximum survey counts obtained during repetitive surveys conducted throughout the season can be used as peak survey estimates. This basic data is shown in Table A13-2.

As seen in the table, eleven observations are available comparing peak aerial survey estimates with total season escapement counts obtained at the weirs. Peak escapement estimates averaged 57% of total escapements with individual observations ranging from 16% to 112%. This data also suggests that a lower percentage of small escapements is accounted for by peak spawning surveys than for large escapements.

Based on this data, peak escapements appear to represent a very conservative (low) estimate of total escapement. The peak escapement for Districts 1-8 in 1982 was 5,618,000.

Investigations are currently being conducted by the Alaska Department of Fish and Game as part of joint U.S./Canada salmon research to develop a method for estimating total escapements from multiple survey counts and stream life survival functions. Data from stream life studies at Traitors River near Ketchikan in 1976 were used to derive the survival function

$$\ln S = [(t/22.9)^{4.1}]$$

where \ln is the natural logarithm and s is the proportion of live pink salmon remaining in the stream t days after entry. (J. Jones, personal communication.) The constant 22.9 is the estimated median stream life in days, that is the number of days after which 50% of the fish would have died. Research conducted during the 1983 season is expected to provide more information on mean stream life for different types of streams.

For a stream with multiple surveys, the number of live fish observed during the first survey which are still present during the second survey are estimated using the above survival function and the first survey count. This number is then subtracted from the second survey estimate giving the number of new fish in the stream at the time of second survey. For the third survey, the numbers of fish remaining from the first and second surveys are estimated. The estimates of new fish at the time of each survey are then summed to obtain an estimate of total escapement.

Based on the 1983 studies, the survival function and mean stream life estimate from the Traitors River study may represent a reasonable first approximation to an average survival function for Southeastern Alaska streams. Using the above survival function and multiple survey counts obtained in 1982 for 44 streams in District 1 with 5 or more surveys, total escapements were estimated for each of the streams. Results are shown in Table A13-3. Estimated total escapements represent an average increase of 49.7% or about 50% above peak escapements.

Applying this expansion factor to 1982 peak pink salmon escapements for each district yields an estimated total southern Southeastern Alaska escapement of 8,427,000. Given available data this would seem to represent a most likely estimate of the 1982 total escapement.

An approximate 90% confidence interval for the mean percentage of increase of total escapement over peak escapement for the 44 streams in Table A13-3 is 41% to 58%. The upper end of this confidence interval produces an estimate of 8,877,000 total escapement from the observed peak escapements.

The above methods yield low, best, and high estimates of 5.6, 8.4, and 8.9 million for the total pink salmon escapement to southern Southeastern Alaska in 1982.

Ref. Cited: Meyer, Marcus W. 1964. Escapement index correlation. Part 8 of Studies to Determine Optimum Escapement of Pink and Chum Salmon in Alaska. ADF&G Final Summary Report for USFWS-BCF Contract No. 14-17-007-22. Feb. 29, 1964.

Table A13-1. Southern Southeastern peak pink salmon escapements by district, 1960-83 (ADF&G 11/3/83).

YEAR	DIST 1	DIST 2	DIST 3	DIST 4	DIST 5	DIST 6	DIST 7	DIST 8	TOTAL
1960	712	69	718	10	99	77	210	32	1927
1961	551	136	496	11	298	473	256	134	2355
1962	1225	470	826	18	479	542	557	118	4235
1963	1186	224	1173	9	271	352	586	114	3915
1964	1536	563	1115	19	412	643	276	181	4745
1965	544	221	917	9	432	437	292	92	2944
1966	1476	650	1554	19	453	467	592	191	5402
1967	442	161	265	12	261	160	171	34	1506
1968	1736	381	785	68	418	436	434	103	4361
1969	682	349	405	40	143	175	162	58	2014
1970	1789	194	1261	42	224	328	314	96	4248
1971	1280	731	1463	60	429	463	482	62	4970
1972	1653	285	795	26	306	366	408	106	3945
1973	752	415	611	60	262	379	338	62	2879
1974	1260	389	743	60	196	235	295	58	3236
1975	1289	709	1300	60	225	324	380	10	4297
1976	1409	722	1335	60	86	538	606	3	4759
1977	2296	680	1200	65	176	327	708	26	5478
1978	2100	506	1511	60	254	241	409	14	5095
1979	850	590	1404	60	398	359	447	68	4176
1980	2369	830	2713	60	123	134	324	17	6570
1981	1726	828	2524	60	280	200	240	24	5882
1982	2110	555	1821	60	243	326	424	79	5618
1983	2754	971	3224	60	533	266	362	27	8197

Table A13-2. Comparison of season weir counts and peak aerial survey estimates of pink and chum salmon in seven Alaska streams during 1961 and 1962. (Data from Meyer (1964)).

Stream	Year	Weir Count	Peak Aerial ¹ Survey Estimate	Percent Peak Aerial Estimate of Weir Count	Ratio of Weir Count to Peak Aerial Survey Estimate
Mallard Cr. (Cook Inlet)	1961	23,128	17,500	75.7	1.32
Windfall Harbor (S.E. AK)	1961	34,976	18,000	51.5	1.94
	1962	9,063	2,800	30.9	3.24
Pleasant Bay (S.E. AK)	1961	62,305	28,000	44.9	3.23
	1962	38,239	35,000	91.5	1.09
Snake Cr. (S.E. AK)	1961	26,089 ²	15,000	57.5	1.74
	1962	93,666	100,000	106.8	0.94
Whale Pass (S.E. AK)	1962	130,928	146,000	111.5	0.90
Lagoon Cr. (S.E. AK)	1961	20,991	3,200	15.2	6.56
Disappearance Cr. (S.E. AK)	1961	20,165	5,100	25.3	3.95
	1962	23,095	3,700	16.0	6.24
				Means	2.74
				Ranges	0.90-6.56

Data Source: Meyer, Marcus W. 1964. Escapement Index Correlation. Part 8 of Studies to Determine Optimum Escapement of Pink and Chum Salmon in Alaska. ADF&G Final Summary Report for USFWS-BCF Contract No. 14-17-007-22. Feb. 29, 1964.

¹ Estimates by experienced aerial observers only.

² Includes 15,000 fish estimated from foot survey to have entered the stream prior to weir installation.

Table A13-3. Observed 1982 peak pink salmon escapements and estimated total escapements for 44 streams in Southeastern Alaska District 1 with 5 or more surveys.

Stream Code No.	No. of Surveys	Peak Escapements	Est. Total Escapement	Percent Increase
101 11 14	5	18793	29286	55.8
101 11 65	5	8423	16003	90.0
101 11 101	9	23000	23271	1.2
101 15 19	8	33500	47536	41.9
101 27 19	9	2400	3342	39.2
101 27 28	5	3500	5262	50.3
101 27 36	8	11003	15955	45.0
101 29 6	11	14282	27438	92.1
101 30 9	8	5120	9653	88.5
101 30 30	13	36003	40203	11.7
101 30 60	11	30000	40204	34.0
101 30 83	8	100003	175729	75.7
101 30 89	6	21000	21164	0.8
101 30 95	6	6540	8924	36.5
101 45 24	11	45403	66504	46.5
101 45 78	13	34003	40941	20.4
101 55 9	5	45000	51412	14.2
101 55 20	14	88003	116594	32.5
101 55 40	9	28376	33395	17.7
101 55 87	6	13189	17417	32.1
101 60 9	7	21520	35475	64.8
101 60 15	5	9694	19704	103.3
101 60 25	7	30000	32582	8.6
101 60 30	7	56122	72241	28.7
101 71 8	6	31934	42185	32.1
101 71 14	8	34498	40153	16.4
101 71 16	6	12000	23924	99.4
101 71 28	6	11500	23368	103.2
101 71 63	5	15764	28299	79.5
101 75 5	9	64003	76742	19.9
101 75 15	5	27174	29033	6.8
101 75 76	6	16851	24377	44.7
101 80 3	6	29740	53781	80.8
101 90 50	13	51003	103031	102.0
101 90 61	10	17531	30624	74.7
101 90 68	5	12568	12803	1.9
101 90 71	9	11194	18216	62.7
101 90 72	8	8003	13449	68.1
101 90 75	5	750	1285	71.3
101 90 76	5	3500	3500	0.0
101 90 80	9	34000	70291	106.7
101 90 84	8	10500	11608	10.6
101 90 86	6	10212	18724	83.3
101 90 92	10	26000	49159	89.1

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